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NINTH ANNUAL REPORT

OF THE

SECRETARY

OF THE

STATE BOARD OF HEALTH

OF THE

STATE OF MICHIGAN,

FOR THE

FISCAL YEAR ENDING SEPT. 30, 1881.

MICHIGAN STATE BOARD OF HEALTH
SEAL.

BY AUTHORITY.

LANSING:
W. S. GEORGE & CO., STATE PRINTERS AND BINDERS.
1882.

Office of the Secretary of the State Board of Health,
Lansing, Michigan, December, 1881.

To Hon. DAVID H. JEROME, *Governor of Michigan:*

Sir:—In compliance with the laws of this State, I present to you the accompanying Report for the fiscal year ending September 30, 1881.

Very respectfully,

HENRY B. BAKER,

Secretary of the State Board of Health.

RESOLUTION OF THE BOARD RELATIVE TO PAPERS PUBLISHED IN ITS ANNUAL REPORT.

Resolved, That no papers shall be published in the Annual Report of this Board except such as are ordered or approved for purposes of such publication by a majority of the members of the Board; and that any such paper shall be published over the signature of the writer, who is entitled to the credit of its production, as well as responsible for the statements of facts and opinions expressed therein.

CONTENTS.

PAGE.

- Presentation of the Report to the Governor, iii
- Resolution relative to Papers in the Annual Report, iv
- Members of the Board, Names, Residences, Expiration of Office, vii
- Standing Committees, viii
- Work of the Board, and Work in the Office,—Fiscal Year 1881, viii-xlv
  - Collection of Information, Fiscal Year 1881, ix-xvii
    - Annual Reports by Health Officers and Clerks, xii-xiii
    - Returns of Names of Health Officers, xiii-xvi
    - Meteorological Reports, xvi
    - Reports of Sickness, xvi
  - Compilation of Material Collected, xvii
  - Dissemination of Information by Reports, Circulars, Documents, etc., xvii-xviii
  - Secretary's Report of Property,—Fiscal Year 1881, xviii-xxxii
  - Expenditures by the Board,—Calendar Year 1880, xxxii
  - Abstracts from Proceedings at Meetings of the Board, Fiscal Year, 1881, xxxiii-xlv
- Special Reports and Communications, xlv-lxii
- Proceedings and Addresses at Sanitary Convention at Flint, 1-83
  - Announcement and Program, 3-5
  - Mayor's Welcoming Address, by Hon. Zach. Chase, 5-6
  - Introductory Address, by Prof. R. C. Kedzie. 6-9
  - Opening Address, by Hon. George H. Durand, 9-15
  - Domestic Sanitation, by J. H. Kellogg, M. D., 16-25
  - Some Thoughts on Sewerage and its Adjuncts, by Daniel Clark, M. D., 26-29
  - On Intemperance as a Cause of Destruction of Human Life, by Mrs. E. Clark, 30-31
  - Sanitation and Christianity, by Rev. Chas. H. W. Stocking, D. D., 31-38
  - Some of the Dangers to Health Pertaining to Pioneer Life, by A. W. Nicholson, M. D., 38-44
  - Domestic Sanitation, by J. H. Jerome, M. D., 44-49
  - The Force Value of Foods, by Prof. Victor C. Vaughan, M. D., 49-53
  - Plan for a Board of Health for the City of Detroit, by Prof. Henry F. Lyster, M. D., 54-61
  - Forests and Trees as Sanitary Factors, by John S. Caulkins, M. D., 61-68
  - Reports of Committees, 69-70
  - Report on the Diphtheria in the Michigan Institution for the Education of the Deaf and Dumb, by D. Clarke, M. D.. 71-74
  - Report of the Grand Rapids Sanitary Association, by Rt. Rev. Geo. D. Gillespie, and C. H. Maxim, M. D., 75-77
  - Is the Grade-work of our Public Schools in its Nature and Requirements Detrimental to the Health of Pupils? by Prof. M. T. Gass, 78-83
- Proceedings and Addresses at Sanitary Convention at Battle Creek, 85-183
  - Announcement and Program, 87-89
  - Welcoming Address, by Hon. E. C. Nichols, 89-90
  - Address, by D. C. Jacokes, D. D., 90-93
  - President's Address, by Rev. D. F. Barnes, 93-94
  - Legal and Other Measures for the Prevention of Casualties, by Hon. Le Roy Parker, 95-104
  - Compensating Conditions in the Causation of Sickness, by Milton Chase, M. D., 104-107
  - The Systematic Study of Causes of Sickness and Deaths, by Henry B. Baker, M. D., 107-125
  - The Sanitary Relations of a Single Point in the New Physiology of Alcohol, by A. F. Kinne, M. D., 126-136
  - Personal Sanitary Responsibilities, by Jno. K. Allen, 136-142

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PAGE.
Consumption: Is it a Contagious Disease? What can be done to prevent its Ravages? by Bela Cogshall, M. D., 142-151
Nostrums in their Relations to the Public Health, by Albert B. Prescott, M. D., 151-160
Some of the Evils which result from the free and injudicious administration of Nostrums to Infants and young Children, by Amos Crosby, M. D., 160-164
Report of a special committee on Criminal Abortion, 164-168
The Health Service of a State, by Geo. E. Ranney, M. D., 169-179
Sanitary Rules versus Medical Theories, by Hon. Foster Pratt, M. D., 179-184
Means of Promoting the Public Health, by Rev. J. Morgan Smith, 185-188
Report of Committees, 188
Annual Address by the President of the Board, Prof. R. C. Kedzie, 189-190
Health Legislation in Michigan, by Hon. Le Roy Parker, 191-194
Syphilis (the Great Pox), by Henry F. Lyster, M. D., 195-200
Report on Epidemic, Endemic, and Contagious Diseases, by Henry F. Lyster, M. D., 201-204
Restriction and Prevention of Diphtheria, 205-210
Restriction and Prevention of Scarlet Fever, 211-218
Contagious Diseases, General Rules for their Prevention and Restriction, 219-220
Relation of Preventable Sickness to Taxation, by John H. Kellogg, M. D., 221-226
Report on Public Health,—American Social Science Association, by Hon. Le Roy Parker, 227-229
To Exclude Contagious Diseases from Schools, by Hon. Le Roy Parker, 230-231
Sanitary Science Examinations,—Regulations, and Questions, 232-236
American Public Health Association, Report of meeting, by Henry B. Baker, M. D., 237-241
Relative to Sugars and Syrups, 242-248
Illuminating Oil, 249-251
Diseases in Michigan in 1880. Replies by Correspondents and Summary by the Secretary, 252-288
Prevention and Restriction of Small-pox, 289-304
Weekly Reports of Diseases in Michigan in 1880, Compilations and Comments by Secretary, 305-402
Meteorological Conditions in Michigan in 1880. Compilation by Secretary, 403-467
Index (followed by Errata), 469-

ILLUSTRATIONS.

Diphtheria at Fredericville, Crawford Co., lvii
Diagrams, Diseases in Michigan, by Months in 1880, from Weekly Reports:—
1, Bronchitis, Pneumonia, Diarrhea, and Cholera Morbus, 308
2, Influenza, Diphtheria, Tonsilitis, Croup, and Cholera Infantum, 382
3, Intermittent, Remittent, Typhoid, and Typho-Malarial Fevers, and Cerebro-Spinal Meningitis, 400
4, Inflammation of Bowels, Dysentery, Whooping-Cough, Measles, and Scarlatina, 401
5, Rheumatism, Neuralgia, Consumption, Erysipelas, etc., with Av. of 26 Diseases, 390
Diagrams, Meteorological Conditions, by Months in 1880:—
I., II., Average Temperature at 12 Stations, 419, 420
III., Range of Temperature at 12 Stations, 425
IV., V., Absolute Humidity (grains of vapor in a cubic foot of air) at 13 Stations, 429, 430
VI., VII., Relative Humidity (per cent of saturation) at 13 Stations, 433, 434
VIII., Cloudiness, Average Per Cent at 9 Stations, 436
IX., Days on which Fogs were observed, at 25 Stations, 439
X., Rainfall, Inches of Rain and Melted Snow at 9 Stations, 444
XI., XII., Ozone, Day and Night, Degree of Coloration by, at 16 Stations, 449, 451
XIII., XIV., Velocity of Wind at Lansing, by Months and Hours, 455, 457
XV., XVI., XVII., Direction of Wind at 19 Stations, Months and Year, 459, 460
XVI., Atmospheric Pressure, Average at 12 Stations, 467

REPORT.

This is the Ninth Annual Report of the Secretary of the Michigan State Board of Health, and is for the fiscal year ending September 30, 1881. The first part of the volume, that paged in Roman numerals, contains the Secretary's report of the work of the Board, the Secretary's report of property, which contains the list of accessions to the Library, abstracts of the proceedings of the Board at its meetings, and special reports, communications, etc. The second part of the volume contains forty-eight addresses, papers, and reports on different sanitary subjects. Of these, there were fifteen presented at each of the Sanitary Conventions at Flint and at Battle Creek, and the remaining eighteen comprise eight by members of the Board, four documents prepared by special committees of the Board, three compiled from reports by regular correspondents, health officers, and meteorological observers for the Board, one was prepared in the office from correspondence, one is the questions, etc., of the Sanitary Science examinations. One is made from material furnished by a well-known chemist of Boston, and thanks are returned to him for his kindness. The three articles on the Systematic Study of the Causes of Sickness and Deaths, Meteorology in Michigan in 1880, and Weekly Reports of Diseases in Michigan in 1880, are graphically illustrated by diagrams, which it is believed greatly facilitate an understanding of the facts therein presented.

The papers are printed, as before, under the following resolution of the Board:—

> "*Resolved*, That no papers shall be published in the Annual Report of this Board except such as are ordered or approved for purposes of such publication by a majority of the members of the Board; and that any such paper shall be published over the signature of the writer, who is entitled to the credit of its production, as well as responsible for the statements of facts and opinions expressed therein."

The names and postoffice addresses of the members of the Board, and the date of expiration of their terms of office, at the close of the fiscal year are as follows:—

Hon. LeRoy Parker, President, Flint, Jan. 31, 1883.
Rev. Daniel C. Jacokes, D. D., Pontiac, Jan. 31, 1883.
Henry F. Lyster, A. M., M. D., Detroit, Jan. 31, 1885.
John H. Kellogg, M. D., Battle Creek, Jan. 31, 1885.
Arthur Hazlewood, M. D., Grand Rapids, Jan. 31, 1887.
John Avery, M. D., Greenville, Jan. 31, 1887.
Henry B. Baker, M. D., Secretary of the Board, and Superintendent of Vital Statistics, Office at Lansing.

STANDING COMMITTEES.

1. Epidemic, Endemic and Contagious Diseases,—Henry F. Lyster, M. D.
2. Sewerage and Drainage,—Henry F. Lyster, M. D.
3. Food, Drink, and Water Supply,————.*
4. Buildings—Public and Private: Including Ventilation, Heating, etc.,—Rev. D. C. Jacokes.
5. Climate, Geology, Topography, and Vegetation in their Relations to Health,————.*
6. Disposal of Excreta and Decomposing Organic Matter,—John H. Kellogg, M. D.
7. Poisons, Explosives, Chemicals, Accidents, and Special Sources of Danger to Life and Health,————.*
8. Occupations, Recreations, and Habits in Relation to Health,—John H. Kellogg, M. D.
9. The Relations of Schools to Health,————.*
10. Sanitary Survey,—Rev. D. C. Jacokes, Hon. LeRoy Parker, and Henry B. Baker, M. D.
11. The Death-Rate as Influenced by Age, Climate, and Social Condition,—Henry B. Baker, M. D.
12. Legislation in the Interests of Public Health,—Hon. LeRoy Parker.
13. Finances of the Board,—Hon. LeRoy Parker.
14. Mental Hygiene,————.*
15. Diseases of Animals in their Relation to Public Health,—Henry B. Baker, M. D.
16. The Relations of Preventable Sickness to Taxation,—John H. Kellogg, M. D.

WORK OF THE OFFICE OF THE BOARD, FISCAL YEAR, 1881.

As in the last Report of this Board, the work of the office, as well as the work of the Board, may be summarized under three heads,—the Collection of Information, the Collation and Evolution of Information, and the Dissemination of Information. The first includes the gathering from a large number of regular correspondents, meteorological observers, health officers, and other officers of local boards of health, the material, which when put into proper shape will best yield good results in the study of the causation of sickness and deaths in this State. The several classes of persons from whom these reports of different kinds are secured, are more prominently mentioned in the pages of this Report where their reports are published.

The second class of work,—Coördination of Information—includes the work of the office in assorting, tabulating, collating, and preparing the collected material into properly arranged records, tables, etc., or in papers for publication in the Report of the Board, it being possible to create new and important information from the results thus tabulated.

The Dissemination of Information requires study as to how best to put before the people the information thus gained, in order to make it of most practical use to them. This work includes the distribution of the Reports of the Board, the pamphlets and other documents relating to the restriction of particular diseases, and relative to the health of the State during each week, etc. It is the endeavor of the office, with the means at its disposal, to secure as thorough and judicious a distribution of its publications as possible.

---

*Vacant.

COLLECTION OF INFORMATION, FISCAL YEAR, 1881.

ANNUAL REPORTS BY HEALTH OFFICERS FOR THE YEAR ENDING DEC. 31, 1880.

In January, 1881, a circular (41) after having been approved by the Board, was sent to the health officer of each township, city and village in the State, about 1,275 in all, transmitting a blank form [I], for their use in making their annual reports to this office. At the same time, a copy of a blank for a copy of their record of diseases dangerous to the public health, was also sent. The blank for a copy of this record is printed, reduced in size, on page 278 of the Report of this Board for 1879. The number of reports on these blank forms received from health officers is stated in a tabular summary on page xii.

Circular 41 is as follows:—

[41.] OFFICE OF THE SECRETARY OF THE STATE BOARD OF HEALTH,
Lansing, Michigan, January, 1881.

To the Health Officer:

SIR,—Herewith I send you a blank form [I] for your use in making your annual report to this Board, required by law,* for the year ending December 31, 1880.

Please fill out and return the report as soon as possible.

The blank form is somewhat similar to the one sent to the clerk of your board, but your report should be made according to your best knowledge, leaving his report to be made by him according to his best knowledge. If each of you will report to this office the cases reported to himself we will then know the total number of cases reported, and to which class of officers the greatest number of reports are made; and if we have estimates of the probable number of cases not reported, made by two different persons in each locality, we may gain a good idea of the actual condition of the public health and of the public health service in the different parts of the State. As soon as sufficiently accurate and complete reports are received from such a proportion of the localities as will be fairly representative, it is designed that they shall be compiled and published. Although many specific facts have been learned from the reports of those health officers who have made satisfactory reports, general truths concerning the entire State cannot well be reached by compilation of reports when only the best, or poorest townships of many counties are represented; it is therefore important that every health officer shall make a report. For a similar reason, every blank should be filled. If no sickness has occurred within your jurisdiction, or if there has been no case of any disease concerning which a report is asked, it is important to state that fact, and the reason, if known, for such healthfulness, and also the population ,etc., in the blank spaces provided for those statements in the report. It is also important to fill the blanks for the probable number of cases of diseases not reported to you. It is necessary to have uniform blank forms, because it is impossible to compile from letters and postal cards, on account of the time required to search through them; and for this reason, every fact to which the report relates should be entered in its proper place in the report, and no character of uncertain meaning (as a dash or an X) should be used when the question can be answered in words or figures. The dash should be used only to indicate that a blank which needs no word or figure to express the truth has not been overlooked.

Your report should be made out for the exact territory over which your board has jurisdiction, and for which you are the health officer, and it should not include anything outside of such jurisdiction. A township board of health does not have jurisdiction in an incorporated village, even though such village be situated within the limits of the township. If you have been appointed health officer for a township and an incorporated village, it is necessary that you make separate reports for each, just as separate as if they were made by different persons.

Please ascertain and report as completely as possible, the causes of all fires within your jurisdiction during the year 1880; also the number of lives lost, and of persons injured in consequence thereof.

I send you a blank sheet for your report of cases of diseases dangerous to the public health. If you have any cases on your record, please fill out and return this report as soon as possible. If you have more cases to report than can be reported upon one side of a sheet (28), please write to this office for blanks, stating the additional number of sheets you need. If you have no case to report please send a definite statement to that effect in paragraph 11 of the blank form; and whether you have cases recorded or not, please state in paragraph 10 of the blank form your belief as to the number of cases of each of such diseases that have occurred within your jurisdiction that have not been legally reported to you.

---

* Act No. 81, Laws of 1873, Sec. 8.—It shall be the duty of the health physician and also of the clerk of the local board of health in each township, city, and village in this State, at least once in each year, to report to the State Board of Health their proceedings, and such other facts required, on blanks and in accordance with instructions received from said State Board. They shall also make special reports whenever required to do so by the State Board of Health.

The blank which I send you for your report of cases of diseases is essentially the same form as the one several times recommended by this Board as a proper form for a record of such cases. For the purpose of beginning or continuing such a record, you can obtain sheets, or books of sheets, similar to this one, except that they are for a record instead of a report, of W. S. George & Co., Lansing, Mich., for eighty cents per quire, or three dollars per hundred. If desired, the same dealers will bind them at usual prices. They will also supply, for one dollar per hundred, blank notices for the use of householders and physicians in complying with sections 1734 and 1735, compiled laws of 1871, and section 1740 of compiled laws of 1871, as amended by Act No. 145, laws of 1879, which sections require householders and physicians, under liability to a fine for non-compliance, to report to the local board of health cases of diseases dangerous to the public health. In connection with these notices, your attention is respectfully asked to Act No. 157, laws of 1879, relative to duties of health officers of cities and villages. It is again recommended that your board of health have copies of these blank notices thoroughly distributed within your jurisdiction, in order to call attention to the law, and secure material for a complete record in your office, relating to diseases which endanger the public health.

It is not expected that it will always be possible, from the notices which you receive, to fill every column of your record; but so much as it is possible to learn concerning each case should be recorded and reported, because the single fact of the number of cases of sickness from each such disease will be of value in connection with the records of deaths and other knowledge collected at this office. It is hoped that you will not fail to record all cases of such diseases under your own care.

In case any disease should appear in your locality as an epidemic, please make a special report of the fact to this office as soon as possible. It is also expected that you will study and record the conditions coincident with the rise, progress and decline of any such epidemic, and in due time report the same to this board. Concerning every such occurrence you should be able to report some facts which will be of use in advancing the cause of public health.

By direction of the State Board of Health.

Very respectfully,

HENRY B. BAKER, *Secretary.*

Please preserve and file the circulars which you receive from this office.

Blank form [I] is as follows:

HEALTH OFFICER. ☞PLEASE FILL ALL BLANKS.☜

[Before filling any blanks, please read carefully through the entire form, including foot-notes and instructions.]

[I.] ☞DO NOT CHANGE OR MARK OUT ANY PRINTED MATTER.☜

To the Secretary of the State Board of Health: Sir,—This ANNUAL REPORT TO THE STATE BOARD OF HEALTH by the HEALTH OFFICER of the*.................. of.... ...., County of ...., State of Michigan, FOR THE YEAR ENDING DECEMBER 31, 1880, consists of this form, with[a]................a Report of Cases of Diseases Dangerous to the Public Health,† which have occurred in this*..... ....during the year above stated which is[b] ....sent herewith on.......separate sheet...

1. To the best of my knowledge and belief, the ratio of deaths (from all causes) to inhabitants in this*..................during the year ending December 31, 1880, was[c].........than the average of previous years.

2. The[d].............of the death-rate was probably due to..
....

3. I estimate the number of inhabitants in this*...............at[c]......; and the number of deaths from all causes at[e]...................

4. The per cent of deaths to inhabitants, during the year ending December 31, 1880, was..........

5. Compared with previous years, the ratio of cases of sickness (from all causes) to inhabitants in this*..................during the year ending December 31, 1880, was[c].........than the average.

6. The[d].......crease of the proportion of sickness was probably due to..................................
....

7. The greatest number of the deaths was from the diseases or causes (named in the order of greatest number), as follows:..

8. The greatest number of cases of sickness was from diseases (named in the order of greatest prevalence), as follows:...
....

9. The number of deaths during the year ending December 31, 1880, from Diseases Dangerous to the Public Health† is as follows:‡

---

* For reference marks see notes at end of this Circular.

From small-pox,..............................deaths;
from cholera,..............................deaths;
from scarlet fever,..............................deaths;
from typhoid fever,..............................deaths;
from measles,..............................deaths;
from whooping-cough,..............................deaths;
from cerebro-spinal meningitis,..............................deaths;
from diphtheria,..............................deaths;
from ....,..............................deaths.

10. To the best of my knowledge and belief cases of Diseases Dangerous to the Public Health† have occurred within the jurisdiction of this board, during the year ending December 31, 1880, that have not been reported to me by the householders within whose families the cases occurred, or by the physicians in charge of said cases, as follows:‡ (*These cases are included in the statement in paragraph 12, below.*)

Of small-pox,..............................cases;
of cholera,..............................cases;
of scarlet fever,..............................cases;
of typhoid fever,..............................cases;
of measles,..............................cases;
of whooping-cough,..............................cases;
of cerebro-spinal meningitis,..............................cases;
of diphtheria,..............................cases;
of ....,..............................cases.

11. The numbers of cases of diseases on my record, which I report at this time in detail on the blank for that purpose, are as follows:‡[f]

Of small-pox,..............................cases;
of cholera,..............................cases;
of scarlet fever,..............................cases;
of typhoid fever,..............................cases;
of measles,..............................cases;
of whooping-cough,..............................cases;
of cerebro-spinal meningitis,..............................cases;
of diphtheria,..............................cases;
of ....,..............................cases.

12. Including the cases legally reported to me and those not so reported, the total number of cases of Diseases Dangerous to the Public Health,† which have occurred within the jurisdiction of this board, during the year ending December 31, 1880, were, to the best of my knowledge and belief, as follows:‡

Of small-pox,..............................cases;
of cholera,..............................cases;
of scarlet fever,..............................cases:
of typhoid fever,..............................cases;
of measles,..............................cases;
of whooping-cough,..............................cases;
of cerebro-spinal meningitis,..............................cases;
of diphtheria,..............................cases;
of ....,..............................cases.

13. The date of the first case of each disease was as follows:

Of small-pox,..............................188..;
of cholera,..............................188..;
of scarlet fever,..............................188..;
of typhoid fever,..............................188..;
of measles,..............................188..;
of whooping-cough,..............................188..;
of cerebro-spinal meningitis,..............................188..;
of diphtheria,..............................188..;
of ....,..............................188..;

14. The date of the last case was as follows:

Of small-pox,..............................188..;
of cholera,..............................188..;
of scarlet fever,..............................188..;
of typhoid fever,..............................188..;
of measles,..............................188..;
of whooping-cough,..............................188..;
of cerebro-spinal meningitis,..............................188..;
of diphtheria,..............................188..;
of ....,..............................188..;

15. So far as known, the sources from which the diseases were derived were as follows:[g]

Of small-pox,..............................;
of scarlet fever,..............................;
of measles,..............................;
of cerebro-spinal meningitis,..............................;
of cholera,..............................;
of typhoid fever..............................;
of whooping-cough..............................;
of diphtheria,..............................;
of ....

16. I attribute the[h]..............................in this*..............................,during the year ending December 31, 1880, to the following causes or circumstances:..............................

....

17. During the year ending December 31, 1880, the climatic conditions observed by me were as follows:..............................

....

18. So far as I can ascertain,..............................fires have occurred in this*..............................during the year ending December 31, 1880, from causes as follows:..............................

....

and..............lives were lost and..............persons injured, in consequence thereof.[i]

19. During the year ending December 31, 1880, I have attended........meetings of this board of health, and the following measures were adopted in the interests of public health:..............................

....

20. Cases of Diseases Dangerous to the Public Health† now prevail at time of completing this report as follows:

Of small-pox,..............................cases;
of cholera,..............................cases;
of scarlet fever,..............................cases;
of typhoid fever,..............................cases;

of measles,..............................cases; | of diphtheria,..............................cases;
of whooping-cough,..............................cases; | of ....,..................cases.
of cerebro-spinal meningitis,..................cases;

21. In my opinion, the principal sources of danger to life or health in this*.................., at the present time, are as follows:..

My P. O. address is..Co.

I hereby certify that, to the best of my knowledge and belief, the statements in the foregoing report are correct.

Dated.............................., 1881.

Signed..,

*Health Officer of the**....................*of*....................

POSTAGE MUST BE PREPAID ON THIS REPORT AT THE RATE OF ONE CENT FOR EACH TWO OUNCES IF NOT SEALED. IF THE ENVELOPE IS SEALED, OR IF A LETTER IS ENCLOSED, THE WHOLE IS SUBJECT TO LETTER POSTAGE, WHICH IS THREE CENTS FOR EACH HALF-OUNCE, OR FRACTION THEREOF.

---

* Insert the word "township," "city," or "village."

† This is the term employed in the law. It includes all communicable diseases, whether epidemic, infectious, or contagious.

‡ In filling blanks followed by such words as "deaths," "cases," etc., numbers should be stated if possible, either in words or figures, and "0" should be written where that expresses the truth; for the reason that a *blank space indicates that the item has been overlooked*, and a dash or an X should not be used in place of a cipher, because the dash is usually employed to indicate that a blank which should not be filled with a figure or letter has not been overlooked.

[a] If not sent, insert the syllable "out."

[b] If not sent, insert the word "not."

[c] Insert the word "greater," "less," or "the same," as the fact may be. If much greater or less, say so.

[d] Insert "in" or "de," according as the sickness may have increased or decreased.

[e] Insert the number in figures.

[f] If there is absolutely no case to report, the blank form for cases need not be sent in as part of your report. But it is important to fill all the blanks after names of diseases on this form, with ciphers if that expresses the truth, to show that you have no case of each disease.

[g] After each disease insert the words "the disease was contracted in the city of..............," or "at the school in..............," "in a room occupied by persons sick with the same disease..............(time) since," "by means of clothing worn by patient with same disease," etc., etc., as the facts may be. In the case of typhoid fever, if the privy was near the well, or within the dwelling, state the facts.

[h] Insert the words "excessive mortality," "excessive sickness," "general healthfulness;" or otherwise express the facts.

[i] Please state whether any lamp explosion has occurred, and especially mention any injuries to persons thereby.

In the foregoing report, PLEASE FILL ALL BLANKS IN SOME WAY TO SHOW THAT NONE HAVE BEEN OVERLOOKED.

Please answer the questions as they are printed, and in the blanks left for the purpose. *Do not change or mark out any of the printed matter.* If you wish to communicate any item which will not go in the blank as printed, please write on a separate sheet of paper.

ANNUAL REPORTS BY CLERKS OF LOCAL BOARDS OF HEALTH, FOR THE YEAR ENDING DECEMBER 31, 1880.

At the same time that the blanks were sent to the health officers, a circular [42], which had been approved by the Board, was sent to the clerk of each local board of health in Michigan, together with a blank form [J], and a blank for a copy of his record of cases of diseases dangerous to the public health. This circular and blank form are similar to those sent to the health officers, only they are not so minute in the questions relating to sickness and deaths. The number of reports received from both health officers and clerks is shown in the following tabular summary:—

TABULAR SUMMARY.—*Number of Annual Reports on Forms [I] and [J], and copies of Records of Cases of Diseases Dangerous to the Public Health, received from Health Officers and Clerks of Local Boards of Health, for the year ending December 31, 1880.*

BOARD OF HEALTH.	ANNUAL REPORTS.			COPIES OF RECORDS OF DISEASES DANGEROUS TO THE PUBLIC HEALTH.		
	Total.	By Health Officers.	By Clerks.	Total.	By Health Officers.	By Clerks.
Total..............................	1,030	485	545	456	262	194
Township..............................	918	416	502	394	218	176
City..............................	21	14	7	18	13	5
Village..............................	91	55	36	44	31	13

COMPLETION AND CORRECTION OF REPORTS.

As in previous years, it has been found necessary to demand better reports from some officers, and to ask for corrections from others, but it is thought the value of these reports increases each year.

RETURN OF NAMES AND POSTOFFICE ADDRESSES OF HEALTH OFFICERS OF TOWNSHIPS, CITIES, AND VILLAGES.

In April, 1881, a circular [44], was sent to all the Supervisors in the State, transmitting a blank form for the return of the name and postoffice address of and other facts respecting the person appointed by the township board as health officer. The circular, which also gives the law under which the appointment must be made, is as follows:—

[This circular is sent to to you as the supervisor for the year 1880; if you are not re-elected for 1881, will you have the kindness to pass the circular, blank form, and printed envelope over to your successor, and call his attention to the fact that it requires immediate attention?]

[44.]

OFFICE OF THE STATE BOARD OF HEALTH,
LANSING, MICH., *April 1881.*

To the Supervisor, as President of the Township Board of Health:

DEAR SIR:—Herewith I send you a copy of sections 1692 and 1693, Compiled Laws of 1871, as amended by Act No. 56, Laws of 1877, which necessitates action by your local board of health "within thirty days after the annual township meeting." The sections, as amended, are as follows:

"(1692.) SECTION 1. In every township the township board shall be the board of health. The supervisor shall be the president, and the township clerk shall be the clerk of said board. The clerk shall keep a record of the proceedings of the board in a book to be provided for that purpose at the expense of the township.

"(1693.) SEC. 2. Every township board of health shall appoint and constantly have a health officer of the township, who shall, where practicable, be a physician and sanitary adviser and an executive officer of the board: *Provided*, That in townships where it is not practicable to secure the services of a well-educated and suitable physician, the board may appoint the supervisor or some other person as such health officer. The board of health shall establish his salary or other compensation, and shall regulate and audit all fees and charges of persons employed by them in the execution of the health laws and of their own regulations. Within thirty days after the annual township meeting in each year the board of health shall meet for the transaction of business and shall appoint or re-appoint a health officer, and shall immediately cause to be transmitted to the Secretary of the State Board of Health, at Lansing, the full name and postoffice address of such health officer, and a statement whether he is a physician, the supervisor, or some other person not a physician. A special meeting of the board may be called by the order of the president or of any two members of said board."

It is important that the person appointed as health officer be promptly and officially notified of his appointment; and his oath of office, required by section 1, Art. xviii., of the constitution of this State, should be on file in the office of the township clerk before the return of his name and postoffice address is sent to this office, which the law requires to be done "immediately."

If for any reason no health officer shall have been appointed "within thirty days after the annual township meeting," it will then be necessary to appoint one as soon as possible to fill the vacancy; as will also be necessary if the officer appointed does not qualify. Vacancies also occur whenever the incumbent of an office ceases to be an inhabitant of the township for which he was elected or appointed an officer.—See section 617, Compiled Laws of Michigan, 1871. The law requires that "every township board of health shall * * constantly have a health officer," and provides for calling special meetings, so that there would seem to be no difficulty in complying with the requirement.

If any change of the health officer occurs, or if his postoffice address is changed, it will facilitate our work if your board will cause a notice of such change to be sent to this office.

In addition to his services as sanitary adviser of your local board of health, it is desirable that your health officer correspond freely with this office, concerning subjects connected with the public health in your locality. Any important sanitary experience of your board may, if thus reported, be made useful to other boards of health throughout the State.

Herewith please find a blank form and printed envelope for the use of your board in sending to this office the statement of name and postoffice address of your health officer, and whether or not he is a physician, as required by this law.

By direction of the State Board of Health.

Very respectfully,
HENRY B. BAKER, *Secretary.*

[After detaching and returning the other half sheet, Form E, please preserve this circular for future reference.]

Blank form [E] is as follows:

[Please fill every blank, by words or figures, or as directed in the foot-notes. Do not mark out any printed words.]

[E.]

To the Secretary of the State Board of Health, Lansing, Mich.:

SIR:—On the......day of.................., 188.., the Township Board, being the Board of Health of the Township of........................., County of........................., State of Michigan, met for the transaction of business and......* appointed a health officer.

The name of the health officer of this township is..,
his postoffice address is..........................., County of..........................., Michigan.
He†............a physician.
He†...........the Supervisor of this township.

‡.., Supervisor,
of the the Township of....................................;

Postoffice address:...

‡.., Township Clerk,
and clerk of the Board of Health;

Postoffice address:...
This return is made out by§..
Dated at....................................., this.....................day of..................., 188..

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*If re-appointed, write "re-;" if not, draw a line.

†Insert the word "is," or "is not," as the case may be.

‡It is not essential that more than one of the officers sign this return, but it is desirable to have the name and postoffice address of each given. If either officer writes in the name of the other, this fact should appear on this return, so that the officer making the return may be known.

§Insert the words "the Clerk," "the Supervisor," "the Clerk and Supervisor," or otherwise state the facts.

[☞ Postage must be prepaid on this return, at letter rate, three cents for each half-ounce or fraction thereof.]

At the same time circular 44 was sent out, a circular [43], was sent to the mayor of each incorporated city, and the president of each incorporated village in the State, accompanied by a blank form [E], on which to make a return of the name and postoffice address of the health officer. Each city and village must appoint a health officer, in order to comply with the law. In order to guard against loss of returns in the mail, a copy of the circular was also sent to the clerk of each city and village.

Circular 43 is as follows:—

[43]● OFFICE OF THE STATE BOARD OF HEALTH,
Lansing, Mich., March, 1881.

To the Mayor and Aldermen of the City, or the President and Council of the Village:

GENTLEMEN:—Your attention is respectfully asked to the general law relative to Boards of Health in this State, as amended by Act No. 56, Laws of Michigan, 1877, which amended section 1693, being section 2 of chapter 46, Compiled Laws of 1871. The amendment is such that, whereas before a health officer might be appointed by the board of health, it is now required that such officer shall be appointed; and if practicable, he must be a physician. The amended law also requires that notice of such appointment shall be sent to the Secretary of the State Board of Health. The section as amended is as follows:—

(1693.) Sec. 2. Every township board of health shall appoint and constantly have a health officer of the township who shall, where practicable, be a physician and sanitary adviser, and an executive officer of the board: *Provided*, That in townships where it is not practicable to secure the services of a well-educated and suitable physician, the board may appoint the supervisor or some other person as such health officer. The board of health shall establish his salary or other compensation, and shall regulate and audit all fees and charges of persons employed by them in the execution of the health laws and of their own regulations. Within thirty days after the annual township meeting in each year, the board of health shall meet for the transaction of business and shall appoint or re-appoint a health officer, and shall immediately cause to be transmitted to the Secretary of the State Board of Health, at Lansing, the full name and postoffice address of such health officer, and a statement whether he is a physician, the supervisor, or some other person not a physician. A special meeting of the board may be called by the order of the president or of any two members of said board.

The amended section 1693 directly refers, as before, only to township boards of health; but section 1740 (section 49 of the same chapter) as amended in 1879, makes it apply to cities and villages. Section 1740, as amended by Act No. 145, laws of 1879 is as follows:—

(1740.) Sec. 49. The mayor and aldermen of each incorporated city, and the president and council, or trustees of each incorporated village in this State, in which no board of health is organized under its charter, shall have and exercise all the powers and perform all the duties of a board of health as provided in this chapter, within the limits of the cities or villages, respectively, of which they are such officers. The provisions of this chapter and the amendments thereto, shall, as far as applicable, apply to all cities and villages in this State, and all duties which are by the provisions of this chapter, to be performed by the board of health of townships, or by the officers and inhabitants thereof, shall in like manner be performed by the board of health and the officers and inhabitants of such cities and villages, with a like penalty for the non-performance of such duties, excepting in cases where the charters of such cities and villages contain provisions inconsistent herewith.

In complying with the law please use the printed envelope and blank form (F) herewith transmitted, to return to this office the name of the physician whom your honorable body appoint, or have appointed, as your health officer for the year 1881. Have the kindness to add a statement of the time when his term of office will expire. Although it is believed to be "practicable to secure the services of a well-educated and suitable physician" in every city and incorporated village in this State, please have the fact whether the health officer is a physician stated in the return, as provided for in the blank form.

A return is expected from your corporation, even though some of the duties of a board of health are delegated to other persons than the mayor and aldermen, or president and council, as the case may be. It is believed that the duty of making a return in accordance with section 1693 as amended. is not delegated, but is one of "the duties of a board of health as provided in this chapter" that must be performed by your honorable body in accordance with the general law hereinbefore referred to, namely section 1740 (Sec. 49, Chapter 46), Compiled Laws of 1871. If a board of health is actually "organized under your charter," and it is therefore clear that this duty should be performed by some other body than your own, will you have the kindness to transmit this communication to that body, and to inform this board of the fact?

The law requires that the local board of health shall "constantly have a health officer." If, by reason of the death, resignation, or removal of your health officer, another person shall be chosen to that office, it will facilitate our work if you will cause a notice of such change to be sent to this office.

The law relative to the health officer very properly requires that "the board of health shall establish his salary or other compensation." In one instance a person who acknowledged that he had been appointed health officer of a city has declined to report to this board, giving as a reason that his appointment was simply nominal, that he received no compensation, and had taken no oath of office, nor signified his acceptance of the office. This leads to the suggestion that the person whom you appoint or have appointed, as your health officer be directed to take and subscribe the official oath required by Section I., Art. xviii., of the Constitution of this State, and file the same with the clerk of your corporation before the return of his name and address is made to this office, which the law requires to be done "immediately."

The law practically requires the local board of health to do whatever is required in the interest of public health within its jurisdiction (see sections 1692 to 1739, chapter xlvi., Compiled Laws of 1871); and also requires that the health officer shall be an executive officer of the local board (see section 1693, Compiled Laws of 1871, as amended by Act No. 56, laws of 1877). In addition to his services as an executive officer and as the sanitary adviser of your local board of health, the law requires that your health officer shall, at least once in each year, make a report to this board, on blanks and in accordance with instructions received from this board; also, that he shall make special reports whenever required to do so by this board. In connection with his other duties, he should be directed by your board to inquire into, study, and record the conditions coincident with the rise, progress, and decline of any outbreak of any communicable or preventable disease; and, besides making the local record, he should be prepared to make his report to this board as valuable as possible. Any important sanitary experience of your board, may, if thus reported, be made useful to the cause of public health throughout the State.

By direction of the State Board of Health.

Very respectfully,
HENRY B. BAKER, Secretary.

Form [F] is as follows:

[Please fill every blank, by words or figures, or as directed in the foot-notes. Do not mark out any printed word.]

[F.]

To the Secretary of the State Board of Health:

SIR,—The name of the health officer of this*................is..
His full postoffice address is..........................., ...County of............Michigan.
He†........a physician.
His term of office expires...
The person who is in fact the Health Physician of this*......is entitled, by our charter:‡..........

By direction of the §..
Signed,..........................Clerk of the*............of..........................;
Dated at.....................this.........day of...............188..

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* Insert the word "city" or "village," as the case may be.
† Insert the word "is," or "is not," as the case may be.
‡ Please insert the words: "Health Officer," "President of the Board of Health," or state that the Health Officer is appointed by your body and not mentioned in the charter, or otherwise convey knowledge of the facts as they may be.
§ Insert the words "Mayor and Aldermen of the City of..........," or "President and Council of the Village of..................;" or "Board of Health of the City (or village) of..................;" if this return is not made by the Common Council.

There were localities from which no return was received, and in June, 1881, a second demand was made on all delinquent townships, villages, and cities, asking for such a return. The total number of health officers returned during the year, is shown in the following statement:—

Health officers of townships	900
Health officers of villages	138
Health officers of cities	38
Total returned in the State	1,076

METEOROLOGICAL REPORTS.

For the year 1881, 329 meteorological registers have been received from the regular observers. Records of meteorological conditions in other cities have been received in connection with mortality reports, which are acknowledged in the Secretary's annual report of property on subsequent pages of this report. A statement of the meteorological instruments sent out during the year, will also be found in the same report.

The names and localities of the observers, and the months for which registers have been received from them in 1880, are stated in Exhibit 26 on page 404. The statements of registers received include both months named.

REGULAR CORRESPONDENTS.

During the year, 16 new correspondents have, by their agreement and the vote of the Board, been added to the official list. The whole number is now 170. The articles on weekly reports of diseases, and the replies to the circular relative to the diseases in Michigan during the year 1880, are compiled from replies by some of these correspondents.

REPORTS OF DISEASES IN MICHIGAN IN 1880.

In reply to circular 40, 24 correspondents made replies relative to diseases in 1880. The circular is printed on pages 252–272, and the summaries made in the office of the Secretary, are printed after each question for which it is a summary. The replies are printed on pages 272–288.

WEEKLY REPORTS OF DISEASES IN MICHIGAN IN 1880.

The system of weekly reports of diseases has been maintained during the year. The compilation of these reports for 1880 is printed on pages 305–402 of this report.

BOOKS AND PERIODICALS.

A list of the books and periodicals that have been received by the Board, in exchange for its publications, is given on pages xx—, together with the names and addresses of the donors.

COMPILATION OF MATERIAL COLLECTED.

As the labor of making weekly reports of diseases and that of taking tri-daily meteorological observations is by no means a light task, it is designed to make the labor as easy as possible. For this reason only the bare records of the observations are asked for, the compilations, computation of results, corrections and reductions to uniform standard, and deductions being performed at the office of the Secretary. For both these classes of observers, complete blanks are furnished for the observers to retain for their own uses, and blanks for the copies which are sent to this office.

The labor necessary to make the various compilations and deductions can be partially appreciated by referring to the articles on Diseases in Michigan in 1880, Weekly Reports of Diseases in 1880, and Meteorology in Michigan in 1880, which are printed in the last part of this volume. Mention of the many reductions of observations of barometers, calculations of relative and absolute humidity, and the uncountable calculations in compiling the article on weekly reports of diseases, may give some idea of the work being done in this State in order to arrive at satisfactory conclusions in regard to the causation of sickness and deaths. The meteorological observers and the observers of diseases both deserve great credit for their interest and faithfulness which enables this Board to continue such an elaborate system of study, a system such as yet is successfully attempted in no other State or country in the world. It may be said that the efforts of the Board in continuing this study and the results already attained, though but a fraction of what is attainable with continued study, are highly appreciated in this State and in other countries. It is a feature of the work which attracts attention and favorable comment by many intelligent journalists, and from every person who carefully examines into the subject as set forth in the Reports. A compilation of the Principal Meteorological Conditions in Michigan in 1880, is printed on pages 403——. An article based on Weekly Reports of Diseases is printed on pages 305–402. The article on Diseases in Michigan in 1880, compiled from annual reports by correspondents, is printed on pages 252–288.

In addition to the compilation of the material, a very important branch of the work of the Office is the careful reading of the proof on all material published, both in the Annual Reports, and in all documents, circulars, blanks, etc.

DISSEMINATION OF INFORMATION.

The information thus collected and made by this Board has been put before the people as much as possible. The Report has been distributed to the officers entitled to receive it and to other persons coming under the intention of the law. The Board has also printed and distributed in large numbers, copies of the documents on the "Restriction and Prevention of Diphtheria," and on the "Restriction and Prevention of Scarlet Fever," and numerous circulars indicating the duties of health officers and of local boards of health. Another mode by which much information is asked for and endeavored to be disseminated is by the correspondence from the office. This part of the work has been much increased during the past year or two. Much of this correspondence has been in response to requests for advice to officers of local boards of health, and to individuals who write directly to the office. It is possible to answer many of these communications by sending some publication of the Board, but others require advice not yet touched upon in any paper published by the Board.

REPORT OF THE SECRETARY RELATIVE TO PROPERTY, ETC., FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1881.

To the President and Members of the Michigan State Board of Health:

GENTLEMEN:—In compliance with section 5 of Article II. of the by-laws of this Board, the following report of the "nature and amount of property belonging to the Board, which has been received, issued, expended, and destroyed since the last report, and of the property remaining on hand, and also in whose care each item of property is intrusted," is respectfully submitted.

For an account of the instruments and articles of a similar nature, which were on hand at the time of making the last reports, you are respectfully referred to pages xii.–xv. of the Report for 1875, xxvii.–xxxi. for 1876, xl.–liv. for 1877, xxxv.–xlviii. for 1878, xix.–xliii. for 1879, and xxi.–xxxvi. for 1880. Since that time articles of this class have been purchased as follows:—

Twelve Green's Standard Barometers (vernier reading to 100th inch.)
Ten Wollaston's Psychrometers (dry and wet bulb.)
Ten sets Wollaston's Registering Thermometers (maximum and minimum.)
Two Rain-gauges.
One extra tube for Rain-gauge.
Two Snow-gauges.
Three electrotype plates,—State Capitol, Seal of the Board, and map of diphtheria district in Whiteford, Monroe Co.
One set of Draughting Instruments.
One Novelty Paper Fastener.
One Rubber Dating-Stamp.
Two Letter Copying-books.
One-fourth dozen Ivory Paper-folders.
One-fourth dozen Steel Erasers.
One dozen Paper Weights.
One dozen Pamphlet Cases.

One of the psychrometers was purchased with money furnished by W. C. West, M. D., of Monroe, who broke the one loaned to him by this Board.

Meteorological instruments have been intrusted to observers as follows:—

BAROMETERS (one each) to—

Lee S. Cobb, Winfield.
L. G. North, M. D., Tecumseh.
F. D. Parmelee, Hillsdale.
J. E. Fair, Harrisville.
Albert Yates, M. D., Washington.
Lewis Marvill, Parkville.
James S. Reeves, M. D., Niles.

REGISTERING THERMOMETERS (one set each) to—

John Bell, M. D., Benton Harbor.
E. S. Richardson, M. D., Reed City.
Fred. Sweet, Hastings.
F. D. Parmelee, Hillsdale.
Albert Yates, M. D., Washington.
J. E. Fair, Harrisville.
L. G. North, M. D., Tecumseh.

PSYCHROMETERS (one each) in the care of—

A. W. Nicholson, M. D., Otisville.
A. B. Simonson, M. D., Minong, Isle Royal.
A. H. Boies, Hudson.
J. E. Fair, Harrisville.

A wet bulb thermometer (to replace one broken) has been placed in the hands of E. S. Richardson, M. D., of Reed City.

One cup for psychrometer has been sent to L. G. North, M. D., Tecumseh, to replace one worn out.

A standard THERMOMETER has been placed in care of J. S. Reeves, M. D., of Niles, and a minimum registering thermometer in care of J. H. Kellogg, M. D., of Battle Creek.

A RAIN-GAUGE has been supplied to A. B. Simonson, M. D., Minong, Isle Royal. An extra tube (for overflow) has been sent to J. S. Reeves, M. D., Niles.

Upon the removal of A. W. Nicholson, M. D., from Otisville, the rain-gauge in his hands was placed in the care of Mrs. M. M. Nicholson, who continues the observations.

The instruments at Ionia, upon the resignation of J. J. Grafton, as Warden at the House of Correction, were turned over to his successor, Col. E. C. Watkins.

G. W. Babbitt of Jackson moved to Detroit, and the instruments in his charge were turned over to Capt. Geo. R. Holden.

The psychrometer and rain-gauge in the hands of Lieut. A. H. Boies, of Hudson, were on his removal entrusted to Orrin Dean, Jr., of Hudson.

The psychrometer and rain-gauge in the hands of A. G. Gumaer, of Marshall, were on his removal intrusted to W. T. Drake, of Marshall.

A barometer broken in the care of H. Peters, M. D., of Tecumseh, and two broken psychrometer thermometers, have been returned to the maker for repairs. [Barometer was returned Oct. 3, 1881.]

The Millspaugh oil-tester in the hands of Dr. Kedzie at the time of the report for 1879 has been returned.

Books and other publications have been received and placed in the Library of the Board (during the fiscal year ending Sept. 30, 1881), as follows:—

BY PURCHASE:—

40th and 41st Annual Reports of Registrar-General of England, 1877 and 1878.
Sanitary Examinations of Water, Air, and Food. Fox.
Bayley's Pocket-Book for Chemists.
Is Consumption Contagious? Clapp.
Eyesight and How to Care for it. Harlan.
What to do First in Accidents or Poisoning. Dulles.
The Bacteria. Dr. Antoine Magnin. Translated by Dr. Geo. M. Sternberg.
Michigan State Gazeteer, 1881.
American Sanitary Engineering. Philbrick.
Cottage Hospitals. Burdett.
Buck's Hygiene. Vol. II.
7th and 9th Reports, Local Gov't B'd, England. Medical Officers' Reports 1877 and 1879.
On the Antagonism between Medicines, and between Remedies and Diseases. Bartholow.
Encyclopædia Britannica. Vol. XII. Hir.-Ind.
The Truth about Vaccination. Ernest Hart, M. D.
Proceedings Royal Society. Vol. XXVII., No. 185. Jan. 10 to Feb. 21, 1878.
Hygrometrical Tables adapted to the use of the dry and wet bulb Thermometers. Sixth Edition, 1876. Glaisher.
North American Medico-Chirurgical Review for May, 1858.
U. S. Official Postal Guide, 1881. Boston.

Detroit Lancet, 1881. Detroit.
Index Medicus, 1881. New York.
Scientific American and Supplement, 1881. New York.
London Practitioner, 1881. London, Eng.
Nature, 1881. London, Eng.
London Lancet, 1881. American Reprint. New York.
Sanitary Record, 1881. London, Eng.
American Journal of Medical Sciences, 1881, Philadelphia.
Medical News and Abstract, 1881. Philadelphia.
Medical Record, New York, 1881. New York.

Received in exchange for Publications of this Board the following Periodicals (in some instances incomplete volumes):—

Sanitary Engineering, 1881. London.
Medical Brief, St. Louis, Mo.
Laws of Life and The Lecturer, Dansville, N. Y.
Maryland Med. Journal, Baltimore, Md.
Herald of Health, New York.
Canada Lancet, Toronto, Ont.
Metal Worker, New York.
Druggist's Circular and Chemical Gazette, N. Y.
Buffalo Med. and Surg. Jour., Buffalo, N. Y.
Good Health, Battle Creek, Mich.
Sanitarian, New York.
Cincinnati Lancet and Clinic, Cincinnati, O.
Chicago Med. Journal and Examiner, Chicago, Ill.
National Board of Health Bulletin, Washington, D. C.
Ohio Med. Recorder, Columbus, O.
Physician and Surgeon, Ann Arbor, Mich.
Journal of the Franklin Institute, Philadelphia.
Journal d'Hygiene, Paris, France.
Mich. Medical News, Detroit, Mich.
Therapeutic Gazette, Detroit, Mich.
Chicago, Med. Review, Chicago, Ill.
Canada Health Journal, Toronto, Ont.
Obstetric Gazette, Lebanon, Ohio.
Veterinary Gazette, New York.
American Observer, Detroit, Mich.
American Exchange and Review, Philadelphia.
International Jour. of Med. and Surgery, New York.
American Monthly Microscopical Journal, New York.
Medical Bulletin, Philadelphia.
New York Med. Eclectic, New York.
U. S. Signal Service, Monthly Weather Review, and Maps, Washington, D. C.
Sanitary News, Hamilton, Ohio.
Iowa Weather Bulletin, Iowa City, Iowa.
N. C. Medical Journal, Wilmington, N. C.
The Microscope, Ann Arbor, Mich.
Missouri Weather Service, St. Louis, Mo.
Scientific Roll, London, England.
Science and Health, Lewisburgh, Pa.
Ohio Medical Journal, Columbus, Ohio.
National Scientific Journal, Chicago, Ill.
Western Medical Reporter, Evansville, Ind.
Nebraska Weather Bulletin.
Vaccination Inquirer, London, Eng.

BY GIFT, EXCHANGE, ETC.:

From Adams, Miss Rose, London, Eng.:

Industrial Colleges for Preparing Young Men and Women of the Town Laboring Class for Emigration.
Parke's Museum. International Exhibition 1881. List of Awards.
Parke's Museum of Hygiene. International Med. and Sanitary Exhibition, 1881. Official Catalogue.
Set of 64 Tracts of the Ladies' Sanitary Association of London.
22d Ann. Report Ladies' Sanitary Association, April, 1880.
Circular of the Society for the Prevention of Blindness.
23d Ann. Rept. Ladies' Sanitary Ass'tn., April, 1881.
Syllabus of Lectures on Domestic Sanitation, or Health at Home. Richardson.

From Alden, L. P., Coldwater, Mich.:—

7th Annual Report of the Mich. State Public School, 1880.
Education *vs.* Heredity. Alden, 1880.

From Allen, Jno. K., Lansing, Mich.:—

A Pocket Aide-Memoire. Sheperd, 1880.
Circular of the London Sanitary Protection Association.
Extracts from writings of R. C. Kedzie, M. D., condemning use of paper, paint, or calcimine for walls.
Ordinance No. 86, for the Registration of Births and Deaths in Baltimore.
An Ordinance concerning the duties of the Board of Health of Detroit.
Conference of Bread Reform League (Eng.), at Mansion House.
Wheat Meal Bread. M. Yates.

From Ames, Jr., M. D., Azel, Boston, Mass.:—

Report of Committee on Prevention of Venereal Diseases. 8th Ann. Meeting Am. Pub. Health Asstn., New Orleans, Dec., 1880.

From Andrews, L. F., Des Moines, Iowa:—

Sewerage, Drainage, and Disposal of Excreta. Loring.

Restriction and Prevention of Scarlet Fever, and of Diphtheria. Rules and Regulations for Local Boards of Health. Documents issued by the Iowa State Board of Health.

Restriction and Prevention of Small-pox. Issued by State Board of Health, 1880.

From Angell, Geo. T., Boston. Mass.:

Forty-sixth Congress, 3d Session, H. of R. Report No. 199 on Adulteration of Food.

From Atwater, M. D., H. H., Burlington, Vt.:—

Ann. Rept. Health Officer of Burlington, 1880.

From Ayers, C. N., Detroit, Mich.:—

Dipsomania. [From the North-Western Reporter.]

From Baker, M. D., Henry B., Lansing, Mich.:—

The Relations of Schools to Diphtheria and to Similar Diseases. Baker. Reprint from Trans. Am. Pub. Health Ass'tn.

Diagrams Illustrating a Paper on Systematic Study of Causes of Sickness and Deaths.

Regulation of Medical Practice, and a Proposed Bill to Regulate the Practice of Medicine. Baker.

Report on Milk and Dairies in New Orleans.

The Diagnosis of Yellow Fever, and Yellow Fever and Quarantine. Sternberg.

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Report upon an acute specific disease, characterized by a peculiar diarrhea, epidemic among persons who had partaken of refreshments provided at a sale at Welbeck, Notts.

From Ballou, Nahum E., Sandwich, Ill.:

Trans. Ill. State Horticultural Society for 1880.

From Bancroft, M. D., F. J., Denver, Col.:—

Reports Col. State Board of Health, 1879 and 1880.

From Becker, Dr. K., Berlin:—

Monthly Statistical Report of the German Empire. April, May, June, July, Aug., Sept., Oct., Nov., Dec., 1880. Jan., Feb., 1881.

Statistical Year-Book for the German Empire. 1881.

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Sugar Analysis. A description of the methods used in estimating constituents. Benjamin.

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Annual Report of the Health Department of Baltimore, 1878, 1879, and 1880.
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From Chaille, M. D., S. E., New Orleans, La.:—
Proposed Action of the National Board of Health as to New Orleans, in 1881.
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First Report of the State Board of Health of Tennessee. April, 1877, to Oct., 1880.
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Second Ann. Report Dept. of Statistics and Geology, Ind. 1880.
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The Relations of the Clergy to Sanitary Reform. Conover. Reprint from Report State Board of Health, Mich., 1880.
From Cook, Dr. Geo., Concord, N. H.:—
Report of Board of Health and Registrar of Vital Statistics, Concord, 1880.
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Bidrag till utredning of frogan om den krouposa pneumoniens verkliga orsaker och profylax. Eklund.
From Englehardt, Ph. D., Francis E., Syracuse, N. Y.:—
Annual Report Supt. Onondaga Salt Springs, Jan. 18, 1881.
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Proc. Iowa Academy of Sciences, 1875-80.
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Statistics relating to the saline Interests of Mich., 1881.
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A Manual of Accidents and Emergencies.
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Poisons and their Antidotes.
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Circular to the Public from Board of Health of Crystal Lake, Benzie Co., Mich.
From Hatch, M. D., F. W., Sacramento, Cal.:—
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Fourth Ann. Report N. J. State Board of Health, 1880.
Circular B. and C. from N. J. State Board of Health on Infectious and Contagious Diseases of Animals.
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On Climate in the Prevention and Cure of Pulmonary Consumption, with special reference to the Peninsula of Florida. Kenworthy.
From Klayer, Chas. F., Cincinnati, O.:—
Report of Analysis of Ohio River Water and of Cistern Water determining the presence of Sewage and other impurities. Suntz, 1881. 2 copies.
From Klebs, Prof. Edwin, Prague, Austria:—
Ueber anstecken de krankheiten. Klebs.
Pathologie und Therapie der Diphtheritis. Klebs.
From La Fetra, H. A. Brooklyn, N. Y.:—
Report of Brooklyn Board of Health from May 8, 1873, to January 1, 1875.
From Langmuir, Hon. J. W., Toronto, Ont.:—
Thirteenth Ann. Rept. of Inspector of Asylums, Prisons, and Public Charities. Ontario, 1880.
From Lawson, D. T., Wellsville, Ohio:—
Steam-boiler Explosions. The Cause and Remedy Logically deduced from Natural Laws.
From Le Duc, Gen., W. G., Washington, D. C.:—
Special Report No. 22, Dept. of Agriculture, Contagious Diseases of Domestic Animals.
From Legislature of Michigan:—
File 120, H. of R., No. 361. A bill to provide for the inspection of steam-boilers.
File 56., Senate, No. 75. A bill to provide an appropriation for the State Cattle Commission.
File 220, H. of R., No. 570. A bill making an additional appropriation for State Board of Health.
From Letchworth, M. D., Hon. Wm. P., Portageville, N. Y.:—
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Thirty-second Annual Report of Astor Library, 1880.
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Report of State Inspector of Illuminating Oils, Mich., 1880.
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Circular. Dr. Martin's Animal Vaccine Virus.
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Article on "True Animal Vaccination" in N. Y. Med. Record April 20, 1878.
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From McMaster, M. D., H. S., Dowagiac, Mich.:—
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From Means, M. D., T. A., Montgomery, Ala.:—
Trans. Med. Ass't'n of Ala. Report of the State Board of Health, 1880.
From Mears, M. D., J. L., San Francisco, Cal.:—
Annual Report of Health Officer of City and County of San Francisco, 1879-80.
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The Causation of Intermittent Fever, Nicholson. Reprint No. 70, Report of 1880.
Ozone in Nature, Mulvany, Reprint No. 74, Report of 1880.
Relative to Diseases in Michigan, in 1879, Reprint No. 71, Report of 1880.
Restriction and Prevention of Diphtheria, Revised Edition of 1881.
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Reported and Actual Mortality during 1879 in New York City.
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An Act to prevent the adulteration of milk and to regulate the sale of milk, N. J., 1881.
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Vaccination Notice.
Leaflet No. 10. Ready References to Laws and Reports.
Leaflet No. 13. Hints for Preventing Diphtheria.
Leaflet No. 14, Sanitary Rules for Preventing Scarlet Fever.
Leaflet No. 15. Sanitary Precautions for Preventing the Spreading of Infectious Diseases.
Leaflet No. 16. Instructions for Disinfection.
Leaflet No. 24. Concerning the Law to Prevent Adulteration of Food and Drugs.
Leaflet No. 24*a*. An Act to Prevent the Adulteration of Food and Drugs.
Leaflet No. 25. To the Officers of Local Boards of Health of N. Y., and other citizens.
Leaflet No. 25*a*. The Organization, Powers, and Duties of Local Boards of Health.
Leaflet No. 26. Model Sanitary Regulations.
Leaflet No. 28. Organization of the Chemical Examination of Food and Drugs for Prevention of Adulterations, etc.
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Leaflet No. 30. Card Blank, Monthly Report of Prevalent Diseases and Deaths.
Leaflet No. 31. Card Blank, Return of Cases of Small-pox.
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Magnetic Survey of Missouri. From Am. Jour. of Science, Vol. xxi., April, 1881.
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Lectures on the Theory and General Prevention and Control of Infectious Diseases. Russell, and on Air, Water Supply, Sewage Disposal, and Food. Wallace.
Annual Conference on the Progress of the Public Health, England, 1880.
Eighty-second and Eighty-fourth Reports of the Friend's Retreat, near York, 1875 and 1880.
From Osler, M. D., Wm., Montreal, Can.:—
On the Pathology of the so-called Pig-Typhoid.
From Otis, M. D., F. N.:—
On Strictures of the Urethra. Otis.
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8th Annual Report Commissioner Railroads, Mich., 1879.
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From Robbins, M. D., M. M., Aurora, Ill.:—
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From Robertson, Gen'l., Jno. J., Lansing, Mich.:—
Report Adjutant General of Michigan, years 1879-80.
From Row, Sam'l H., Lansing, Mich.:
Annual Report of Commissioner of Insurance of Michigan for 1880. Part First, Fire and Marine.
From Runnels, M. D., Moses T., Indianapolis, Ind.:—
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From Russell, M. D., James A., Edinburgh, Scotland:—
School Life in its influences on Sight and Figure. Two Lectures. Liebreich.
From Russell, M. D., James B., Glasgow, Scotland:—
Remarks to accompany Mortality Tables for Glasgow, 2d and 3d quarters of 1880.
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Transactions New Hampshire State Medical Society for 1880.
From the Secretary of State, Lansing, Michigan:—
Michigan Crop Report for Sept., 1881.
2d Ann. Rept. Secretary of State, Mich., relating to Farms and Farm Products, 1879-80, 2 copies.
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Legislative Manual of the State of Mich., for 1881.
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Sewerage of the City of Grand Rapids. Sekell. Reprint from Report Mich. S. B. of H., 1880.
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Milk Analysis. Reprint from Proc. Am. Pharm. Asst'n.
Milk Analysis. Reprint from Proc. of Am. Acad. of Arts and Sciences, 1877.
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From Speed, M. D., John J., Louisville, Ky.:—
Second Annual Report State Board of Health, Ky., 1879.
From State Librarian, Lansing, Mich.:
Catalogue of the Mich. State Library for 1881-2.
From Stearns, M. D., H. P., Hartford, Conn.:—
Fifty-seventh Ann. Rept. of Retreat for Insane, Hartford, April, 1881.
From Stevens, M. D., Thad. M., Indianapolis, Ind.:—
Second Ann. Report Indiana State Health Commission, 1880.
From Storer, M. D., Horatio R., Newport, R. I.:—
Circular Letter No. 1. Sanitary Protection Association, Newport, R. I.
Annual Report of the Sanitary Protection Association of Newport, R. I., for 1880-81.
From Surgeon General U. S. Army, Washington, D. C.:—
Index Catalogue to Library Surg. Gen'ls office. Authors and Subjects. Vol. II. Berlioz-Cholas.
From Thompson, S. R., Lincoln, Neb.:—
12th Annual Report Superintendent of Public Instruction, Nebraska, 1880.

From Thornton, M. D., G. B., Memphis, Tenn.:—
The Death-Rate of Memphis, by Dr. Thornton, and Circular on the Waring Sewer System, by Maj. Humphreys.
From Townshend, M. D., Smith, Washington, D. C.:—
Report of Health Officer of District of Columbia, for 1879–80.
From Trembley, M. D., J. B., Oakland, Cal.:—
Annual Report and Statistics of the Meteorology, Oakland, 1880.
From Taylor, M. D., J. E., Richmond, Ind.:—
Report on the Water supply of Richmond, Dec. 6, 1880. Weist.
From Taylor, M. D., J. Stopford, Liverpool, England:—
Report of the Health of Liverpool, for 1880.
From Vandervoort, M. D., J. L., New York City:—
110th Annual Report New York City Hospital and Bloomingdale Asylum, 1880.
From Van Riper, Hon. J. J., Buchanan, Mich.:
Annual Report of Attorney General of Mich., for 1880.
From Veenboer, M. D., Melle, Grand Rapids, Mich.:—
Prevention Better than Cure. Veenboer. Reprint from Report Mich. State Board of Health, 1880.
From Voute, C. H., East Saginaw, Mich.:—
Circulars urging the adoption of the pail system for cesspools and privy-vaults in Kalamazoo. Voute.
From Wales, M. D., Philip S., Washington, D. C.:—
Sanitary and Statistical Report of Surgeon General of the Navy, 1879.
Report on Yellow Fever in U. S. S. Plymouth in 1878–9.
From Walker, Gen. Francis A., Washington, D. C.:—
Census Bulletin, No. 174. Distribution of Population as regards Rainfall.
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Report of Director of Detroit Observatory at Ann Arbor, Oct. 1, 1879, to Jan. 1, 1881. Harrington.
From Waring, Jr. Col. Geo. E. Newport, R. I.:—
The Sewerage of Memphis. Storm Water in Town Sewerage. The Sewering and Draining of Cities. Articles by Waring.
Trans. American Society Civil Engineers, CCXVI., Vol. X., Feb. 1881. The Sewerage of Memphis.
Proc. West Ewing Improvement Association, Anniversary Meeting, 1880.
Proposition by the Drainage Construction Co., for the Sewerage and Drainage of Newport, R. I., 1880.
From Weidman, M. D., W. Murray, Reading, Pa.:—
Report of the Board of Health of Reading, 1880.
From Wenzel, M. D., H. P,, Milwaukee, Wis.:—
Fifth, 6th, 7th, 8th, 9th, 10th, and 11th Ann. Reports Milwaukee Board of Health.
From Welfley, M. D., D. P., Cumberland, Md.:—
Buck's Hygiene, Vol. i.
From Windom, Hon. Wm., Secretary of the U. S. Treasury:—
Statistical Abstract of the U. S., 1880. Third Number.
Finance, Coinage, etc.
From Wood, M. D., Thos. F., Wilmington, N. C.:—
First Biennial Report of N. C. Board of Health, 1879–1880.
From Wright, Col. Carroll D., Boston Mass.:—
Twelfth Ann. Rept. Mass. Bureau of Statistics of Labor, 1880.

Excepting certain publications drawn out by members of the Board and others, the foregoing, together with those accounted for as in the library of the Board and those drawn out by members and others, at the date of the report for the fiscal year 1879, and also those received during the fiscal year 1880, are in the library of the Board, and in good condition. Those drawn out and not yet (Sept. 30, 1881) returned, are as follows:—

BY H. O. HITCHCOCK, M. D.

Memoirs on Diphtheria.
Public Health, E. A. Parkes.
Prevention of Cholera Infantum and Kindred Disorders.

BY HON. LE ROY PARKER.

Tyler *et al., vs.* Squires *et al.* Testimony and arguments before the State Board of Health of Mass.
Accidents on Railways. Reported by Capt. Tyler.

General Report upon Accidents which have occurred on Railways of the United Kingdom during 1876.
Lectures on State Medicine, De Chaumont.
Van Nostrand's Eclectic Magazine, Vol. XIX. July to Dec., 1878.
The Sanitary Record. Vols. V. and VI.
An ordinance, relative to the appointment and duties of the City Physician of West Bay City.
Sanitary Record, August 30, 1878.
Thirteenth Annual Report Health Department, Cincinnati.
Report of Committee of the American Public Health Association on Venereal Diseases.

BY REV. D. C. JACOKES.

Report Massachusetts Board of Education on Proposed Survey of the Commonwealth.
Memoir of the American Public Health Association on Legislation affecting the public health.
Circular of inquiry by Wisconsin State Board of Health to School Teachers and Circular to County Superintendents transmitting the same for distribution.
Thirteenth Annual Report of Health Department of Cincinnati, Ohio, 1879.
Seguin on Idiocy.
Superstition and Force, Lea.
Sanitary Engineer for Feb. 15., 1881.

BY DR. HENRY F. LYSTER.

Elkington on Drainage.
Reed on Ventilation.
Separate System of Drainage.
Public Health, June 9, 1876.
Flint on Phthisis.
Climate and Phthisis, Parkin.
The Richmond and Louisville Medical Journal, Oct., 1868.
Report of a Sanitary Commission on Pneumonia.
Uppingham, By-Laws and Regulations on House Drainage.
McCormick on Consumption and Air rebreathed.
Sturges on Pneumonia.
Public Health, A. W. Blythe.
Health and its Conditions.
Meteorology in the Service of Medicine, Schreiber.
Influence of Climate in Pulmonary Consumption.
October, Nov., and Dec. Nos. of Plumber and Sanitary Engineer, 1878.
Statement of Objects of San. Protection Asst'n, Edinburgh.
Statement of Objects of Sanitary Protection Association, Newport, R. I.
Circular from Mass. State Board of Health on Drainage, etc.
Is consumption a preventable disease?
London Medical Times and Gazette, April 5, 1879.
The London Lancet, 1877 and 1878.
Twelve photographs of illustrative diagrams on the influence of climate on Phthisis and Rheumatism.
Circular on "House drainage." Mass. State Board of Health.
Playter's Elementary Anatomy, Physiology, and Hygiene.
Introduction to Study of Biology. Nicholson.
Disease Germs. Their Nature and Origin.
Lectures by Russell and Wallace.
Sanitary Work in Smaller Towns, etc.
Sanitary Engineering. Latham.
Parke's Practical Hygiene.
London Lancet, June, 1881.
Willson's Hand-book of Hygiene.

BY DR. JOHN H. KELLOGG.

The Enameled Sanitary Surface Closet. Circular.

BY HENRY B. BAKER, M. D.

The Bacteria. Magnin.
Journal of Hygiene (French) for Sept. 1, 1881.
Nature Sept. 1, 1881.

BY ARTHUR HAZLEWOOD, M. D.

Mental Physiology. Carpenter.
Physiology of Common Life. Lewes.
Responsibility in Mental Diseases.
Nature, Vol. XVI.
Practical Biology. Huxley and Martin.
Introduction to Biology. Macginley.
Principles of Biology, Vols. I. and II.
Report of Committee on Sanitary Condition of Philadelphia Schools.
1st Report of Commissioner of Health. Milwaukee.
9th Report Mass. State Board of Health, 1878.
Transactions N. Y. State Medical Society—1878, 1879, 1880.
3rd Report Nashville Board of Health.
Sanitary Papers—American Social Science Association, 1874.
The Health of Schools.
Report on School Hygiene. Lincoln.
Our Public Schools. Reeve.
Our School Houses. Chittenden.
Sanitary Record, Aug. 15, 1881.

BY JNO. K. ALLEN.

Kuss on Physiology.
Braune's Atlas of Topographical Anatomy.
Hoblyn's Medical Dictionary.
Dalton's Physiology.
A New Chemistry. Cook.

BY HON. CYRUS G. LUCE.

Report on Petroleum as an Illuminator.

BY A. W. NICHOLSON, M. D.

Taylor's Principles of Medical Jurisprudence. 2 vols.
Physician and Surgeon, May, 1881.

BY. GEO. E. RANNEY, M. D.

Methomania.
Medical Jurisprudence of Insanity.

BY J. H. WELLINGS, M. D.

House Drainage and Water Service.

BY DR. BELA COGSHALL.

Scientific American, July 5, 1879.

BY HON. WM. HUMPHREY.

Buck's Hygiene, vol. I.

BY RT. REV. GEO. D. GILLESPIE.

Transactions Medical Society of the State of New York, 1860.

BY GEN. W. H. WITHINGTON.

Sanitary Engineer, Sept. 1, 1879. Jan. 15, May 15, and Aug. 15, 1881.

BY PROF. CHARLES A. SANFORD.

Journal of the Franklin Institute, Sept., 1881.

WEEKLY OR MONTHLY MORTALITY STATEMENTS.

These reports have been received during the past year, from health officers, registrars, officers of boards of health, or of cities in the United States, and foreign countries, as follows:

Atwater, M. D., H. H., Health Officer, Burlington, Vt.
Bailey, M. D., L. W., Sec'y of Health Dept., Room 2, City Hall, Cleveland, Ohio.
Baldwin, M. D., A. S., Chair. Com. on Vital Statis., B'd of Health, Jacksonville, Fla.
Boyd, Geo., Registrar Vital Statistics, Paterson, N. J.
Briggs, M. D., Albert H., Health Physician, Buffalo, N. Y.
Buckley, M. D., Charles, Health Officer, Rochester, N. Y.
Cabell, M. D., J. G., Prest. Board of Health, Richmond, Va.
Carter, A. Robert, Sec'y City Board of Health, Baltimore, Md.
Cheatham, M. D., Richard, Health Officer, Nashville, Tenn.
Cocchi, A., Il Dirottore, Dell' Ufficio di Statistica e State Della citter di Roma, Rome, Italy.
Collamore, M. D., G. A., Toledo, Ohio.
Day, M. D., Walter De F., Sanitary Supt. and Registrar, New York City.
Dillman, Louis, City Clerk, Detroit, Mich.

Edwards, M. D., Tom O., Health Officer, Wheeling, W. Va.
Fairchild, M. D., M. B., Phy. to Board of Health, Syracuse, N. Y.
Fisher, M. D., A. W., Health Officer, Toledo, Ohio.
Galt, M. D., James D., Health Officer, Norfolk, Va.
Gleason, M. D., M. K., Registrar Vital Statistics, and De Wolf, M. D., O. C., Health Officer, and McVicker, Brock L., Sec'y City Board of Health, Chicago, Ill.
Goldsmith, M. D., W. T., Prest. Board of Health, Atlanta, Ga.
Hatch, M. D., F. W., Sec'y State Board of Health, Sacramento, Cal.
Horlbeck, M. D., H. B., City Registrar, Charleston, S. C.
Hudson, M. D., H. S., Registrar Vital Statistics, Selma, Ala.
Hunter, W. H., City Sexton, Lansing, Mich.
Hunt, M. D., James G., Health Officer, Utica, N. Y.
Jewett, M. D., Henry S., Health Officer, Dayton, O.
Johnston, Dr. W. H., Registrar, Selma, Ala.
Jones, M. D., J. S., Pres., Herrick, M. D., S. S., Sec. State Board of Health, New Orleans, La.
Knight, M. D., A. W., Health Officer, Jacksonville, Fla.
La Rocque, M. D., A. B., Medical Health Officer, Montreal, P. Q.
Lindsley, M. D., Walter, Health Officer, Los Angeles, Cal.
Lindsley, M. D., C. A., Health Officer, New Haven, Conn.
Luedeking, Dr. Robert, Sec'y Board of Health, St. Louis, Mo.
Mattocks, M. D., Brewer, Prest. Board of Health, St. Paul, Minn.
McLeod, A. M., M. D., K., Surgeon Major, Health Officer, Calcutta, East India.
Means, M. D., T. A., Health Officer and Registrar, Montgomery, Ala.
Meares, M. D., J. L., Health Officer, San Francisco, Cal.
Miles, M. D., Abijah J., Health Officer, Cincinnati, Ohio.
Nagle, M. D , John T., Deputy Registrar of Records, New York City
National Board of Health Bulletin, Washington, D. C.
Neal, M. D., Thomas L., Health Officer, Dayton, Ohio.
Park, M. D., J. P., Knoxville, Tenn.
Pelzer, M. D., Geo. S., City Registrar, Charleston, S. C.
Rezner, M. D., W. B., Health Officer, Cleveland, Ohio.
Robinson, M. D., C. V., President Board of Health, Petersburgh, Va.,
Scales, M. D., T. S., Health Officer, etc., Mobile, Ala.
Sherman, M. D., Geo. E., Oakland, Cal.
Snow, M. D., Edwin M., Supt. of Health, Providence, R. I.
Snively, M. D., W., Health Officer, Pittsburgh, Pa.
Thornton, M. D., G. B., President, and King, M. D., R. B., Secy. of Board of Health, Memphis, Tenn.
Townshend, M. D., Smith, Health Officer and Registrar, Washington, D. C.
Trembley, M. D., J. B., Oakland, Cal.
Walcott, M. D., H. P., Health Officer, Boston, Mass.
Wellings, M. D., J. H., Health Officer, Lansing, Mich.
Wight, A. M., M. D., O. W., Commissioner of Health, Milwaukee, Wis.
Woolsey, M. D., E. H., Health Officer and City Physician, Oakland, Cal.
Wyckoff, M. D., R. M., Registrar of Records, Brooklyn, N. Y.

The following table shows the amount and kind of hard paper there was on hand at last report, the amount purchased during the year, the amount used, and the amount now on hand:

KIND OF PAPER.	On Hand at Last Report.		Purchased Since Last Report.		On Hand Now.		Used During the Year.	
	Reams.	Sheets.	Reams.	Sheets.	Reams.	Sheets.	Reams.	Sheets.
Medium		347						347
Folio-post	10	413	11		9	298	12	115
Demy		430	6		6	222		208
Crown	1	113	13		7	402	6	191
Cover paper		218	1			219		479
Manila wrapping paper		337	2		1	262	1	75
Blotting paper		11		120		93		38

The hard paper has been used for making blank books, circulars, announcements for and invitations to sanitary conventions, printed letters and writing paper. The cover paper has been used for covers to reprints, and record-books for weekly reports of diseases, and wrappers for ozone test-paper.

At the time of making the last report, there were about 2,146 sheets of letter, half-letter, and note writing paper; 1 ream and 420 sheets legal cap and foolscap. Since that time there have been purchased 2 reams of plain letter; and 1,500 sheets letter and note have been made from folio-post paper. There are now on hand about 1,912 sheets of letter, half-letter, and note, 1 ream and 202 sheets of foolscap and legal cap. There have been 823 sheets of letter, half-letter, and note issued to members of the Board. This shows about 1,871 sheets of letter and note paper and 218 sheets foolscap and legal cap to have been used in the office.

There were about 41,637 envelopes on hand when the last report was made; 54,000 have been purchased since, making a total of 95,637. There are about 67,961 on hand now, showing that about 27,876 have been used during the year. About 1,250 were issued to members of the Board.

There was on hand at the time of making the last report, postage stamps, unused postal-cards, and postage money to the amount of $122.00. Vouchers for postage and box-rent have been allowed during the year to the amount of $420.35—making a total of $542.35. There is now on hand in postage stamps, unused postal-cards, and postage money, $206.76. This shows that during the year the cost of postage and box-rent has been $335.59. This does not include $4.05 postage allowed to members of the Board.

Some of the principal items of postage have been as follows:—

Distribution of the Report of the Board for 1879, and Reprints......	$7.39
Sending out Circulars 40, 41, 42, 43, and 44, and Forms E, F, I, J, and return postage..........	52.36
Sending weekly meteorological and monthly mortality statements, etc.	27.80
Sending announcements, invitations, and programs for Sanitary Conventions	8.04
Sending (revised) Diphtheria document..........	4.47
Sending out Vital Statistics of 1874..........	23.92
Sending ozone test-paper, blank meteorological registers, and return postage	18.22
Sending blanks for weekly reports of diseases, and return postage (including the distribution of Oct. 1, 1881)..........	52.14
	$194.34

Thus far this report has given exactly, or approximately, the kind and amount of property received, on hand, and disposed of by this office during the fiscal year ending September 30, 1881; but in order to show exactly how much has been expended for all property, and for all other expenses during the time specified, the following statement of expenditures is here presented. It includes vouchers numbers 536 to 633 inclusive.

AMOUNT OF EXPENDITURES BY THE STATE BOARD OF HEALTH, AS PER VOUCHERS NUMBERS 536 TO 633 INCLUSIVE.

Chemical Analysis		$30.00
Engraving, Drawing, etc		------
Expenses of Members	Attending Meetings	171.86
	Other Official	144.51
Instruments and Books		119.37
Paper, Stationery, etc		129.26
Postage	Office	420.35
	Members	4.05
Printing and Binding		319.41
Secretary		2,000.00
Special Investigations		-------
Miscellaneous		75.10
Total		$3,413.91

Respectfully submitted,

HENRY B. BAKER,
Secretary.

Having compared the Secretary's annual report of property received, issued, expended, and destroyed during the fiscal year ending September 30, 1881, with the property book and the record of proceedings, and having examined the foregoing account of expenditures, and compared the same with the books in the Auditor General's office, I find the same to be correct.

LE ROY PARKER,
Committee on Finances of the Board.

Lansing, Mich., Oct. 11, 1881.

EXPENDITURES BY THE BOARD IN CALENDAR YEAR 1880.

The report of money expended given in the annual report of property is for the fiscal year ending September 30, 1881, and as the appropriations granted by the Legislature are for the calendar year, it is deemed advisable to publish also the expenditures for the calendar year. Accordingly the expenses during the calendar year 1880 are here shown as follows:

CLASSIFICATION.

		Amount Expended in Calendar year 1880.
Chemical Analysis		------
Engraving, Drawing, etc		------
Expenses of Members	Attending Meetings	$191.15
	Other Official	48.80
Instruments and Books		185.05
Paper, Stationery, etc		223.55
Postage	Office	574.00
	Members	13.80
Printing and Binding		578.01
Secretary		2,000.00
Special Investigations		9.85
Miscellaneous		175.38
Total		$3,999.59

ABSTRACTS AND BRIEF ACCOUNTS OF THE PROCEEDINGS AT THE MEETINGS OF THE STATE BOARD OF HEALTH DURING THE YEAR ENDING SEPTEMBER 30, 1881.

REGULAR QUARTERLY MEETING, OCTOBER 12, 1880.

The Board was called to order at 9 A. M., in the office of the Board, and in the absence of the president, Hon. LeRoy Parker was chosen president *pro tem.* The following members were present: Hon. LeRoy Parker, Rev. D. C. Jacokes, J. H. Kellogg, M. D., and Henry B. Baker, Secretary. The minutes of the preceding meeting were read and approved.

Dr. Kellogg reported additions to his paper on the Influence of Decomposing Wood on Health, and mentioned the finding of impure ice from decomposing sawdust, and from the collection of organic matter in the water.

Vouchers and bills were allowed, Nos. 536 to 552 inclusive.

Dr. Kellogg retired from the meeting at 10:50.

It was decided that the fees received from the applicants for examination in sanitary science be kept as a separate fund, the Secretary acting as treasurer, and that expenses arising in such examinations be paid out of that special fund. Vouchers 1, 2, and 3 were then allowed from this fund.

The Secretary presented the quarterly report of work in the office, which is on file in the office.

The Secretary made some statements relative to the appreciation of the Reports of this Board by the officers of local boards of health. Many preferred to pay the express charges on them, than to take the chances and trouble of securing them through the county clerk.

The proposed legislation requiring the examination of medical practitioners by this Board, being under discussion, it seemed to be the sense of the Board that it was not best for it to enter on that work.

The Annual Report of Property of the Secretary was presented and referred to the committee on finances of the Board. (See pages xviii.–xxxii. of this Report.)

The names of four physicians were proposed and approved as correspondents of the Board.

The Secretary, as special committee, presented a form of a certificate to be given to those who pass the examination in sanitary science, and he was authorized to have printed a sufficient number of copies in accordance with the general plan.

Afternoon Session, Oct. 12, 1880.

At the afternoon session there were present, Prof. E. A. Strong, Hon. LeRoy Parker, Rev. D. C. Jacokes, Henry F. Lyster, M. D., and Henry B. Baker, M. D., Secretary.

The Secretary presented a paper on Ozone, by J. Mulvany, M. D., of the British navy, which was read before the British Meteorological Society, and stated that Dr. Mulvany had given permission to print it in our Report if desired. It was voted to print it in the Report for 1880. [See pages 277–284 of the Report for 1880.]

Dr. Baker mentioned that another city—Flint—had adopted the system of requiring burial permits.

The Secretary described a method of removing a small-pox corpse from one grave to another, with safety, as shown by results of one such removal under the direction of Health Officer Wellings, of Lansing, Mich.

By vote Dr. Hurd, of the Eastern Asylum for the Insane, at Pontiac, was invited to prepare a paper on the hereditary influence of alcohol in the production of insanity in the third and fourth generations.

The question of Sanitary Conventions being called up, it was voted that two conventions be held during the coming winter, and Rev. Dr. Jacokes, Dr. Baker, and Prof. Strong were appointed a committee to make the necessary arrangements on the part of the Board.

Dr. Lyster presented the subject of restricting the practice of medicine to those who have qualifications, and offered the following resolution:—

Resolved, That a committee of three be appointed by the chair to report at the next meeting upon a plan for the legalization and registration of the medical profession in this State, and to confer with such other organizations or individuals as may be interested in the passage of a bill regulating the practice of medicine by the Legislature of Michigan.

Dr. Baker offered resolutions, and after further discussion the following resolutions were adopted:

1. *Resolved*, That there should be required of all who are to begin the practice of medicine in this State an examination as to their qualifications.

2. *Resolved*, That such examinations by the State should be restricted to questions in demonstrable knowledge as distinguished from questions of mere opinion.

3. *Resolved*, That, as a public health measure, a committee of three be appointed to prepare and report at the next meeting of this Board a plan for furthering the objects stated in the preceding resolutions.

The Chairman appointed as that committee, Dr. Henry F. Lyster, Dr. Henry B. Baker, and Rev. Dr. Jacokes.

The Secretary presented the subject of the sanitary section of the meeting of the International Medical Congress which was to meet in London, England, in the summer of 1881, and the subject of sending some delegate to that meeting was talked over.

Hon. LeRoy Parker mentioned having prepared and sent to the meeting of the American Social Science Association a paper on the best means of enforcing legal measures to prevent the adulteration of food.

Dr. Lyster presented and explained the Stewart Ventilated Sewer Trap.

Dr. Baker presented the subject of the need of systematic study of the causation of intermittent fever, and stated that the weekly reports of diseases showed that this disease caused more sickness in Michigan than any other, and suggested the appointment of a special committee to investigate this disease thoroughly.

Rev. Dr. Jacokes exhibited a drawing of a plan to bring fresh air against the surface of a coal stove for the purpose of ventilation. It was voted to publish the plan in the Annual Report for 1880. [See pages 262–266 of the Report for 1880.]

Dr. Kellogg having stated that his paper on the contamination of water was nearly completed, he was given ten days in which to complete it.

The Secretary reported 41 papers, articles, etc., to go in the Report, and it was voted that the report of the finance committee be printed in connection with the annual report of property.

The Secretary reported that the State Board of Cattle Commissioners had held their first meeting at the office of this Board, and that he was present by invitation. The meeting was very interesting, and he hoped for good work from the commission.

The Secretary reported that hog cholera was regularly reported from the south-western part of the State, and thought the subject should be investigated. It was voted to have the Secretary visit that part of the State, and the sum of $25 was appropriated to carry on such investigation.

The Secretary reported that the sanitary science examinations had been carried on according to the directions of the Board, after the last meeting, and the successful candidates were Dr. Melle Veenboer, of Grand Rapids, and Dr. Henry B. Baker, of Lansing.

It was voted to amend the plan for carrying on such examinations by striking out the words "the Wednesday succeeding," leaving the time for the examination to be "upon the second Tuesday in July." In July, 1881, the paragraph 6 was amended to read "Examinations will be written." It was voted to print the list of questions asked, a list of books which will be found useful to candidates, and the names of the successful candidates in the Report for 1880. [See pages 267–276, and xlvii–xlviii, of the Report for 1880.]

Dr. Baker, special committee to design a seal for the Board, submitted his design and read a report. The report was adopted, and the design was accepted. The thanks of the Board were voted to Mrs. Henry B. Baker for her drawings of the seal.

It was voted that Dr. Lyster be the committee No. 1, on Epidemic, Endemic, and Contagious Diseases, in place of Dr. Hitchcock, resigned. The president *pro tem.* announced that he was authorized to offer the resignation of Dr. Lyster as committee No. 5, and it was accepted and Prof. Strong was elected to that committee. Rev. Dr. Jacokes resigned his appointment as committee number 9, and Prof. Strong was appointed to fill the committee. Rev. Dr. Jacokes was then elected to fill committee number 14, on mental hygiene.

Dr. Baker was appointed a special committee to ask the Board of State Auditors to allow the expense of making diagrams from the general fund.

Material relative to diththeria which had accumulated in the office because of a vacancy on the proper committee, was presented, and the Secretary was authorized to use it in the first part of the Report.

Dr. Baker presented pieces of decayed pine from floors in a new building in Lansing, and described the fungus which seemed to cause the trouble.

On motion the Board adjourned.

REGULAR MEETING, JANUARY 11, 1881.

The Board was called to order in its office by President Kedzie, at 9 A. M., the following members being present: Prof. Kedzie, Hon. Le Roy Parker, Rev. Dr. Jacokes, and Dr. Baker. The minutes of the last meeting were read and approved.

President Kedzie said he had conferred with Governor Jerome relative to the needs of the Board, and stated that the Governor appreciated the work of the Board and had made recommendations in his message accordingly.

Rev. Dr. Jacokes reported verbally some experiments relative to the proper place to put exit registers for foul air from rooms. With two registers of equal size, one at the top and one at the floor-level of the room, the velocity of the upper current of air outward was much greater than from the lower register. When the lower register only was open, the temperature of the room was higher than with both registers open. This showed the waste of heat by drawing foul air from the top of the room.

Prof. Kedzie reported some experiments made by him some years ago, bearing upon the same subject. A glass tube about 30 inches long, having a thermometer at the lower end, and the tube closed to prevent the passage of air through it, was heated at the top end to a temperature of about 750 degrees F., when the thermometer at the lower end rose only one degree in an hour. The tube being opened, and the air drawn through the tube from above downward and out the lower end, the thermometer at the lower end showed a rise in temperature of over 100 degrees in one minute,—showing the great difficulty of heating a room from above downwards, except by causing a flow of warmed air in that direction by taking the foul air from the bottom.

Mr. Parker reported that he had given some study to the subject of the prevention of casualties, and after more investigation he would make a report. [See pages 95–102.]

The Secretary read the quarterly report of work in the office during the last quarter.

The Secretary reported that he had collected samples of sugars and syrups from the dealers in Lansing, and they had been analyzed by Prof. Sharples, and the results of his analyses showed but two of the ten samples of syrups were adulterated, and these were sold under the names of "corn-sugar syrup" and "glucose syrup." [See pages 242–248 of this Report.]

The Secretary presented blank forms for the reports of health officers and clerks, which were approved by the Board and ordered printed.

Dr. Baker was appointed a committee to devise a plan for compiling the information contained in the reports of health officers and clerks.

Dr. Kellogg came in and took his seat as a member of the Board.

The Secretary presented a proposed circular to regular correspondents relative to diseases in Michigan in 1880, which was approved and ordered printed.

Prof. Kedzie spoke of a superstition in some parts of Russia of the prevention of diphtheria by placing a wafer in the mouth of one afflicted with the disease, and then in the mouth of the one to be protected. It would be difficult to conceive any more fruitful way of spreading the disease.

Hon. Mr. Parker was requested to draw up a bill providing for the additional appropriation mentioned in the message of the Governor, and to act according to his judgment in getting it before the committees.

Prof. Kedzie reported the results of a sample of apple jelly which had poisoned a large family. He found three grains of oxide of zinc to each ounce of the jelly. It was probably in the form of malate of zinc, formed by the action of the acid of the fruit on galvanized iron, which is iron coated with zinc.

Bills were allowed, vouchers numbered 553 to 571, amounting to $1,016.63.

Afternoon Session, Jan. 11, 1881.

At 2 P. M. the Board came to order, the following named members being present: Prof. Kedzie, J. H. Kellogg, M. D., Rev. Dr. Jacokes, Hon. Mr. Parker, and Dr. Baker.

Dr. Kedzie reported the examination of peaches afflicted with the "yellows." The samples were of fine appearance, red, especially about the pit; the meat was watery and decomposed rapidly; chemical analysis showed an excess of water and a deficiency of sugar and jelly-forming material. He read letters from persons claiming that eating the peaches did not cause sickness, and from others who had been made sick by them. He was authorized to add to his report for publication in the Annual Report.

Dr. Baker read a letter from Prof. Strong, regretting his inability to be present, and stating that he could not act as a member of the Board.

Mr. Parker reported that he had prepared a bill providing for the inspection of steamboats on inland lakes, and he was requested to take measures to get it passed by the Legislature.

Dr. Baker made a report as special committee to investigate the subject of hog-cholera. His report included a description of his visit to the infected localities, in the southwestern part of the State, also letters from farmers, physicians, etc, who had given the subject attention. He also presented a sample of lard purchased in Lansing, which had caused the severe illness of five persons, and which had been examined by Prof. Detmers, of Chicago, who claimed to have found the micrococci of hog-cholera in the lard. The report was accepted and Dr. Baker was requested to continue the investigation.

Dr. Baker made a report of the last meeting of the American Public Health Association, which he attended at the request of this Board. [Printed on pages 237–241.]

Dr. Kedzie made a verbal report of the meeting of the Sanitary Council of the Mississippi Valley at New Orleans, Dec. 7–12, 1880.

Dr. Baker, as special committee, reported that he had conferred with the Board of State Auditors, and that they had authorized the expenditure of $80 to illustrate the Report of 1880.

Rev. Dr. Jacokes reported relative to holding Sanitary Conventions, and suggested that the second one be held at Romeo. The invitation to hold one at Flint was formally accepted, and the thanks of the Board were tendered to the citizens of that place who had labored to make a successful convention at that place. The President of the Board was invited to speak to the convention at Flint on behalf of this Board.

It was voted that when the Board adjourn it be to meet at Flint in connection with the convention January 25 and 26.

The Secretary was authorized to purchase draughting instruments for the use of the office, not to exceed $18, and to purchase six psychrometers for the use of the meteorological observers of the Board.

Two correspondents were added to the list.

The Secretary stated that where contagious diseases prevailed most extensively, it had been very frequently found that the same localities had failed to appoint a health officer as the law requires.

The Secretary reported relative to a seal for the Board and he was authorized to procure a seal for the office of the Board.

The Board adjourned to meet at Flint.

PROCEEDINGS AT THE SPECIAL ADJOURNED MEETING AT FLINT, JANUARY 26, 1881.

The Board met at the office of Mr. Parker, the following members being present: Dr. Kedzie, Dr. Kellogg, Mr. Parker, and Dr. Baker. The Secretary read an invitation to hold a Sanitary Convention at Coldwater, signed by many of the prominent citizens of the place. He also presented an invitation for a convention from the common council of East Saginaw, which was presented by Dr. Cleveland, the health officer of that city. Dr. Kellogg renewed his invitation for a convention at Battle Creek, and the invitation from Battle Creek was accepted by the Board. The Secretary was requested to transmit to the persons sending the invitations from East Saginaw and Coldwater, a communication setting forth the facts respecting the previous invitation from Battle Creek, and regretting the inability of the Board to accept their invitations this year, stating that if the invitations were renewed for the next year, they would be favorably considered.

Bills and accounts were allowed,—vouchers numbered 572 to 577, amounting to $30.69.

The Board adjourned to meet at call of the President.

PROCEEDINGS OF THE SPECIAL MEETING OF THE BOARD AT BATTLE CREEK, MARCH 30, 1881.

The meeting was held pursuant to the following call by the President:

"*To Members of the State Board of Health:*

"GENTLEMEN,—A special meeting of the State Board of Health is hereby called at Battle Creek, on Tuesday and Wednesday, March 29 and 30, 1881, to transact business connected with the Sanitary Convention at that time and place, and such other business as may come before the meeting, including the auditing of accounts."

"Very respectfully,

"R. C. KEDZIE, *President.*"

The Board came to order, and Mr. Parker was chosen President *pro tem.*, the following members being present: Rev. Dr. Jacokes, Mr. Parker, Dr. Kellogg, and Dr. Baker.

Bills and accounts were allowed,—vouchers 578–580, to the amount of $19.01.

Dr. Baker moved and the Board voted: That the cordial thanks of this Board are extended to the citizens of Battle Creek for the invitation to hold this Sanitary Convention in their city; and to the local committee, officers of the convention, editors of local papers, and the many other citizens of Battle Creek, who have exhibited so much interest and have labored with so much zeal in making this convention perfectly successful, and very pleasant to those who came to attend it.

The Board then adjourned.

PROCEEDINGS OF THE BOARD AT THE ANNUAL MEETING AT LANSING, APRIL 12, 1881.

The Board came to order, Dr. Lyster being President *pro tem.*, and the following members being present: Rev. Dr. Jacokes, Dr. Lyster, Dr. Hazlewood, and Dr. Baker.

The minutes of the last quarterly meeting and of the two special meetings at Flint and Battle Creek were read and approved.

The Secretary read a communication from Prof. Kedzie announcing his determination to decline a reäppointment as a member of this Board and his retirement as a member of the Board and its President. Dr. Kedzie's letter was ordered published in the Annual Report as the annual address of the president. The Secretary was appointed a committee to draft resolutions expressive of the sense of loss experienced by the Board in the retirement of Dr. Kedzie.

On account of the absence of three members, the rule requiring the election of a President at this meeting was suspended and the election postponed.

The Secretary read a letter from Dr. Kedzie, saying that his resignation having been accepted by the Governor, he would not be present at this meeting.

A communication from Mr. C. H. Voute, giving the amounts of material removed by his men in the trip of the Odorless Excavating Apparatus through this State, and the thanks of the Board were voted to Mr. Voute for his communication, and it was referred to Dr. Kellogg with the request to prepare it for publication, or incorporate it in his report.

The Secretary presented the subject of the International Medical Congress, and he was authorized to cast the vote of the Board for a suitable and competent physician in Michigan to represent the Board at that meeting, and gain any information for the benefit of the public health which may be possible.

A vote of thanks was extended to Prof. Sharples for his analyses of samples of sugars and syrups made for this Board.

Afternoon Session.

At 2 P. M. the Board was called to order, the same members of the Board being present as at the morning session.

The Secretary presented several communications from different parts of the State relative to the custom of oil inspectors of testing a few barrels in a car-load and marking the whole approved, contrary to the spirit of the law. The Secretary was directed to obtain the opinion of the Attorney General of the the State with reference to the proper interpretation of the law in this particular. [Printed on pages 249–251.]

A letter from Dr. John Mulvany was read, giving account of the symptoms and *post mortem* appearance of persons suffering from the effects of eating meat undergoing putrefaction, and he was requested to write a paper on the subject, for publication in the Annual Report.

A letter from A. J. Murray, V. S., relative to the collection of vital statistics of animals, was referred to Dr. Baker, committee on diseases of animals.

The names of nine physicians were approved as regular correspondents of the Board. The resignation of Dr. O. E. Herrick of Grand Rapids as a correspondent was accepted.

The subject of the publication of the addresses and papers of the sanitary conventions was taken up, and the Secretary was directed to take up each paper and report relative to its publication at the next meeting of the Board. A letter was read from Dr. L. A. Warsabo, of Coldwater, renewing the invitation for a sanitary convention in that city. A communication from Dr. V. C. Vaughan, Secretary, and Dr. George, President of a meeting of citizens of Ann Arbor, inviting this Board to hold a convention in that city was presented. The invitation was accepted. The Secretary was instructed to correspond with persons in East Saginaw with reference to a convention there.

The request of Dr. Vaughan for the use of the plates, and permission to print Dr. Baker's paper in his journal, was granted.

Dr. Lyster reported that as special committee to prepare a plan for a health service for the city of Detroit, he had spent a great deal of time on the subject, had read a paper at the sanitary convention at Flint, and, after consultation with the city attorney of Detroit, had prepared a bill which had been placed in the hands of a Senator from Detroit for introduction in the Senate. The report was accepted. [Plan is printed on pages 54–61.]

It was voted that at the sanitary science examination in July the examinations be in writing, and that each member ask ten questions not heretofore asked. The Secretary was directed to send a notice to the medical editors of the State, giving notice of this examination.

The Secretary read a report relative to the prevalence of "winter cholera" in the southern portion of the State, and in two State institutions, and as the cases were in that portion of the State supplied with products from the Chicago market, thought it might be due to some product of hogs suffering from hog cholera. It was voted to issue a circular to correspondents relative to the subject.

Dr. Baker, as special committee to prepare a plan for the compilation of the reports of health officers and clerks of local boards of health, made a report and submitted a plan for such compilation.

Bills and accounts were allowed, vouchers numbered 581 to 602, amounting to $859.57.

Dr. Hazlewood suggested the translation of the documents on the restriction and prevention of diphtheria and of scarlet fever into the German and Holland languages. Dr. Baker thought they should be revised in the English language first. It was voted that Dr. Baker and Dr. Lyster be a committee to revise the said documents and submit the revision to the Board for approval, and when approved that there be printed thirty thousand copies, and that electrotype plates be secured. It was voted that Dr. Hazlewood be a committee to secure the translation of these documents when revised into the German and Holland languages. It was then ordered that the small-pox document be treated in the same manner, that is, be revised and translated.

Dr. Baker, committee to draft resolutions relative to the regret at losing Dr. Kedzie as a member of the Board, reported a preamble and resolution, which were adopted, as follows:

WHEREAS, By advice of members of the State Board of Agriculture, Professor R. C. Kedzie, President of this State Board of Health, has thought it necessary, because of demands on his time to fulfill his duties of Professor at the State Agricultural College, to decline a re-appointment as a member of this Board; therefore,

Resolved, That it is with extreme regret that this Board learns that Professor Kedzie must sever his connection with it; that his eminent labors in the interests of public health in this State are very highly appreciated by this Board; that the Board is happy to know that though no longer one of its members, he will continue to take interest in, and give encouragement to its work; and that the Board extend to Professor Kedzie hearty thanks for his past invaluable services, and the wishes of every member for his future happiness and prosperity.

Dr. Lyster was requested to attend the public health section of the American Medical Association on behalf of the Board, May 3, 1881.

It was voted that Prof. R. C. Kedzie be asked to attend the meeting of the Sanitary Council of the Mississippi Valley to be held at Evansville, Indiana.

The Board then adjourned until the next regular meeting, or subject to the call of the President *pro tem.*

PROCEEDINGS OF THE BOARD AT ITS REGULAR MEETING, JULY 12, 1881.

In the absence of the President *pro tem* chosen at the last meeting of the Board, Hon. LeRoy Parker was chosen President *pro tem*, and the roll-call showed Mr. Parker, Rev. D. C. Jacokes, Dr. Hazlewood, Dr. Avery, and Dr. Baker present. The minutes of the last meeting were read and approved. During the reading of the minutes Dr. Lyster came in and took his seat as a member of the Board. Dr. Kellogg came in about 9:20 and took his seat.

The Board proceeded to ballot for a President, and the result showed the election of Hon. LeRoy Parker.

Dr. Jacokes mentioned the formation of a Sanitary Association at Pontiac, and said there was need for such effort there. He spoke of the spread of small-pox by an immigrant-tramp-burglar, who communicated the disease to another prisoner. The clothing left in the pest-house was supposed to have been disinfected, having been treated for that purpose, the pest-house locked up, and labeled. The clothing was stolen, however, and the disease communicated to sixteen persons by it, and the disease was still further spread by them. He said the information as to what constitutes disinfection was much needed there, and it was owing to inefficient disinfection that the disease was conveyed by the clothing. He thought a circular giving the best methods of disinfection was a desirable thing to have published. He also gave an account of small-pox in another immigrant a few miles from Pontiac, but in this case it was confined to the one case.

Dr. Kellogg spoke of the organization of a sanitary association at Battle Creek soon after the sanitary convention held there. The subjects of cleanliness, disinfection, and the examination of drinking water had received attention.

Dr. Avery asked if expenses of caring for cases of small-pox should be borne by the townships or by the county. Mr. Parker replied that if the people sick or their parents were unable to pay, the law required the expense should be met by the county. In no case could it be a township charge. Dr. Avery related the spreading of small-pox near Greenville, the first case being a man who slept with a lately arrived immigrant, who said that on board the ship he sailed there were no cases of small-pox although there were cases of diphtheria. The first case of small-pox was not very sick, and all the following cases were mild. He said about sixteen cases occurred on four corners of four townships. The immigrant who is supposed to have brought the disease did not have it himself. About two weeks before the first case appeared, he slept with the man who first came down sick with it. The man was sick about twelve days before the disease was discovered, and he had exposed his family. Three came down in twenty-five days, and afterwards others. [It has since been learned that a woman who came over on the same ship as the immigrant, but who settled in another township, also came down with small-pox, showing conclusively that the disease was introduced by the immigrants.]

Referring to the work done by the Sanitary Associations at Pontiac and at Battle Creek, Dr. Baker spoke of the immediate aid this Board receives through such organizations.

The Secretary read his quarterly report of work in the office. It was filed. He presented a telegram he had received from the health officer of Frederic township, Crawford county, asking for a physician to aid them in checking the spread of diphtheria. He had requested Dr. Hauxhurst, of West Bay City, to go, and he presented Dr. Hauxhurst's report of his trip. It was voted that Dr. Hauxhurst's report be printed in the Annual Report.

The Secretary presented correspondence relative to a sanitary conference at Chicago, to devise means for restricting the introduction of small-pox by immigrants. He also presented correspondence from the State Oil Inspector, that officer promising to give immediate attention to a complaint that oil was branded which was not inspected, also the opinion on this subject from the Attorney General. [See pages 249–251 of this Report.]

The Secretary presented blank forms in use for different purposes by the boards of health of Tecumseh and Grand Rapids.

The Secretary presented an account of a boiler explosion produced at will, by Mr. D. T. Lawson, of Wellsville, Ohio, who thus claims to have demonstrated the correctness of his theory of the causes and the best means for the prevention of boiler explosions. It was referred to committee number 7.

The report of the committee of the American Public Health Association on venereal diseases was referred to the committee on legislation. It was voted that Dr. Baker and Dr. Kellogg be a committee to prepare a tract on proper modes of disinfection.

The document on the resuscitation of the drowned was referred to the committee on accidents, and Dr. Baker, for revision.

The request of the sanitary convention at Battle Creek, that this Board issue a circular on criminal abortion, was referred to Dr. Kellogg as a special committee to report at the next meeting.

Dr. Baker's report of attendance at the meeting of the American Public Health Association at New Orleans, [printed on pages 237–241 of this Report], and the report of Dr. Kedzie on poisoning by eating jelly, were ordered printed in the Report. [See pages following.]

The Secretary was authorized to purchase three psychrometers, twelve barometers, fifteen registering thermometers, for the use of the meteorological observers for the Board.

Afternoon Session, July 12, 1881.

There were present at the afternoon session: Hon. Le Roy Parker, Rev. Dr. Jacokes, Dr. Lyster, Dr. Hazlewood, Dr. Avery, and Dr. Baker.

The name of one physician was proposed and approved as a regular correspondent.

Correspondence relative to the adulteration of syrups and sugars was presented and referred to the committee on foods and Dr. Baker jointly, with a view to its publication.

The proposed change in the law requiring the reporting of contagious diseases which was the subject of a paper by Dr. Foster Pratt at the sanitary convention at Battle Creek was referred to Mr. Parker, committee on legislation.

The Secretary was authorized to have books, periodicals, etc., belonging to the library, bound at his discretion.

A resolution of the American Public Health Association relative to the importance of vaccination was presented.

Preambles and resolutions presented by Dr. Baker, were adopted as follows:—

WHEREAS, Immigrants exposed to small-pox in foreign countries may contract the disease, cross the ocean, and reach places far inland in this country before the disease manifests itself in their persons; and

WHEREAS, Vaccination on arrival in this country is usually too late to prevent the occurrence of the disease in susceptible persons exposed to small-pox on the other side of the Atlantic Ocean; therefore,—

Resolved, That the National Board of Health is hereby earnestly requested to consider (in accordance with an Act to prevent the introduction of contagious or infectious diseases into the United States, approved June 2, 1879), the propriety of making, promulgating, and enforcing rules requiring inspection at the port of departure of immigrants into this country and the vaccination or revaccination of every immigrant who upon such inspection is found unprotected from small-pox. Or failing in any case or for any cause to secure such vaccination or revaccination, to prevent such unprotected persons as may have come from or through any infected district from taking passage on any ship destined for this country, or at least from landing in this country during the period of incubation of the disease, and until such time shall have elapsed as shall make it certain that they are not carrying the germs of small-pox in their own persons.

Resolved, That the Michigan State Board of Health cordially approves the action of the Sanitary Conference held in Chicago, June 29 and 30, for the prevention of the further introduction of small-pox into this country by immigrants, and its spread from one State into another, and that in the proposed effort to unite all health authorities in an organized plan of concerted action to prevent the extension of small-pox, and to secure future immunity from small-pox by means of general vaccination, this Board will co-operate to the full extent of its powers.

Resolved, That the attention of every local board of health in Michigan is respectfully asked to the details of the plan for immediate action, recommended by the late Sanitary Conference at Chicago, which in connection with the preceding preambles and resolutions is further indicated as follows:—

"That to meet present emergencies the National Board of Health, by virtue of its power to prevent the introduction of contagious and infectious diseases into the United States and their spread from one State into another, be requested to take such measures as will secure the inspection of every immigrant before landing at the ports of the United States, and of the vaccination of all persons not protected.

"That local health authorities should as far as practicable cause a thorough inspection of immigrants at all distributing points, and the detention at such points of all suffering from small-pox, and also the vaccination by the local authorities, if needed, of all immigrants who arrive at their destination.

"Finally the local health authorities should maintain, as far as necessary, a certain watchfulness over the immigrant family, in order to discover the first evidence of suspicious sickness.

"But a more important duty rests upon the local boards, viz.: persistent efforts to secure vaccination of unprotected persons within their jurisdiction. At this time, when there is great popular alarm in regard to small-pox, local boards should use their utmost efforts to make vaccination and revaccination (the only real safeguard against small-pox) universal. Vaccination should not only be offered but urged persistently upon those who neglect it, and restrictive measures, as expulsion from the public schools, should be enforced against those who refuse."

Resolved, That, in accordance with the foregoing, the State Board of Health respectfully and earnestly calls upon all health officers and local boards of health in Michigan to secure a careful inspection of all immigrants entering and remaining within their jurisdiction and a prompt vaccination or revaccination (with pure and fresh bovine vaccine virus) of all persons not protected against small-pox—these precautions being especially necessary respecting immigrants, because of their having come in contact with people and baggage from nearly all parts of the world, and therefore very much more liable to have picked up the contagia of diseases than are our citizens at their homes.

Dr. Baker offered preambles and resolutions looking to the establishment of a sanitary inspection of immigrants by the National Board of Health as follows:

WHEREAS, Many more immigrants enter the United States by the port of the city of Port Huron, Michigan, than by any other port in this country, New York only excepted, the numbers at Port Huron being about 100,000 annually, and no quarantine or inspection is maintained there by any health authority; and—

WHEREAS, The country is suffering from contagious diseases and especially small-pox, introduced in many cases by immigrants, their baggage, wearing apparel, etc., and it is a matter of national importance that the introduction of these diseases be checked as soon as possible; and—

WHEREAS, While the laws of Michigan provide for quarantine and disinfection by the local health authorities, at expense of persons quarantined, there is no State or municipal fund available for inspection, vaccination, and disinfection of persons and things in transit and without detention; therefore,—

Resolved, That in accordance with section 3 of an Act to prevent the introduction of infectious and contagious diseases into the United States, approved June 2, 1879, the National Board of Health is respectfully requested to make and submit for approval by the President of the United States, "such additional rules and regulations as are necessary," and either authorize this State Board to execute such rules and regulations, at the expense of the National Board of Health, or appoint a health officer of the port, or a sanitary inspector of the port, and such assistants as may be necessary, at the city of Port Huron, Michigan, whose duties shall be to examine while in transit and without detention all immigrants arriving at that port; to detain or effectually *isolate in transit* all persons suffering from small-pox, diphtheria, scarlet fever, typhus fever, cholera, yellow fever, or any other disease dangerous to the public health; to disinfect all infected baggage, wearing apparel, cars, vessels, ferry-boats, etc., and to vaccinate with pure and fresh bovine vaccine virus all immigrants unprotected from small-pox and recently exposed to that disease or coming from or through infected places; to report to the National Board of Health respecting all vaccinations and revaccinations made by them; to co-operate with State and other boards of health; and to promptly communicate to such boards of health information relative to the entry or proposed entry within their jurisdiction, of immigrants, and the facts respecting their liability or non-liability to introduce any disease dangerous to the public health.

Resolved, That the National Board of Health is respectfully requested to consider the propriety of taking action, similar to that requested relative to Port Huron, respecting other ports to the eastward of this State where such action as is herein suggested has not been inaugurated, and from whence immigrants come and pass into and through this State, and may thus endanger citizens of Michigan more than do immigrants by way of Port Huron, many of whom pass directly on to cities and States farther west.

Pending the discussion, the Secretary read resolutions adopted by the State

Board of Health of Tennessee, and showing that the action of the National Board of Health at southern ports has been received with confidence. After some discussion the resolutions were adopted.

The Secretary was authorized to order reprints of articles, etc., in the Annual Report in such numbers as shall be determined in each case by the President and the Secretary.

The Secretary was directed to prepare a tract on Hospitals for Communicable Diseases.

Paragraphs 4 and 5 of the regulations for the examination of candidates in sanitary science were amended so as to read as follows:

4. Each and every candidate for examination shall, before appearing at the examination, pay to the Secretary of the Board an examination fee of one dollar.

5. The examination fee of those applicants who do not receive the certificate of the Board will be returned to them.

It was voted that applicants not able to be present at this meeting be examined at the October meeting of this year. The Secretary was directed to change the regulations as printed, in accordance with the amendments.

Bills and accounts were allowed, vouchers 603–630, amounting to $1,026.97.

Dr. Lyster reported cases of small-pox in Detroit, and that a provisional board of health had vaccinated about twenty thousand persons, and the disease was checked. He also reported cases of rheumatism and cerebro-spinal meningitis, the two diseases seeming to be connected in some way. He then reported more fully upon the advances which had been made in the knowledge respecting the vitality of charbon disease germs. His report included extracts from three important articles, and he was requested to prepare the report for publication in the Report. [See pages 201–204 of this Report.]

Commenting on Dr. Lyster's subject, the Secretary remarked that the experiments by Büchner (Medical Record, New York, June 18, 1881) seemed to show that the common bacillus of hay infusions—*bacillus subtilis*—is transformed into the virulent *bacillus anthracis*—the cause of splenic fever—if cultivated so as to prevent its coming to the air, and that *bacillus anthracis* can be converted into the harmless *bacillus subtilis* by cultivation in free air. He said Prof. Law, of Cornell University, has proposed a general law for the production of mild viruses to cause modified forms protective against fatal forms of diseases,—that law being their cultivation in presence of free oxygen.

Dr. Lyster remarked with reference to sewerage and drainage in Detroit, that more sickness was found in cottages than in two or three storied tenements; the cottages were often too near the ground and not well drained.

Hon. Mr. Parker reported considerable legislation on subjects connected with public health. He read an abstract of the titles of several acts passed, and mentioned the defeat of the act for the inspection of steamboats on inland lakes, speaking of an instance under his personal knowledge, where the engine of a small steamer is one condemned for use elsewhere; another engine had exploded while the party belonging to the boat were on land for a season. [See pages 191–194 of this Report for titles of Acts passed.]

Dr. Baker reported having gathered material for his article on hog cholera and glanders, and mentioned the investigation by Dr. Ballard of the General Board of Health of Great Britain, regarding an outbreak of sickness caused by eating pork, and suggested that it may have been the disease commonly known as hog cholera.

Drs. Lyster and Baker presented a revised document on the restriction and prevention of diphtheria. The document was amended and adopted, and referred to the Secretary for publication as previously ordered. [Printed on pages 205–210 of this Report.]

The Secretary was authorized to edit for publication the proceedings of the two sanitary conventions held in 1881.

The Secretary was requested to give at each meeting of this Board hereafter a brief summary of the work done by other State Boards of Health.

Mr. Parker was chosen a delegate of the Board to the meeting of the American Social Science Association at Saratoga.

The Board then adjourned until the next regular meeting or at the call of the President.

SPECIAL REPORTS OF DIPHTHERIA, SCARLET FEVER, SMALL-POX, ETC.

Too much can hardly be said of the importance of having a health officer properly informed, and duly instructed beforehand by the local board to proceed with measures for the restriction of a disease dangerous to the public health on the appearance of the first case, before many persons have been exposed to the contagium and many houses have become infected. It is believed that recently by such preparatory action on the part of local boards of health many epidemics of diphtheria and scarlet fever, and even epidemics of small-pox have been prevented, and that others might have been so prevented. Before a meeting of the local board of health can be had (the members of which are often absent from home), the most favorable moment for the suppression of the disease may have passed. The health officer needs to have considered beforehand what is best to do, and what he has authority to do; needs to have already received and carefully studied the instructions issued by the State Board of Health.

The following letters, received at this office, are published as bearing upon the restriction and prevention of diphtheria, etc.:

SIX DEATHS FROM DIPHTHERIA IN ONE FAMILY, IN BUNKERHILL TOWNSHIP, INGHAM CO.

There is a family located on section 18 (farm marked W. W. Fisk on county atlas), township of Bunkerhill, Ingham Co., Mich., who are suffering with diphtheria. There have been six deaths in the house in a few days. I have been informed to-day that the township board of Bunkerhill talk of burning the house; they meet to-night to decide the matter. Now, will not the burning of this house endanger the whole settlement? Most of the neighbors have large families, and I am afraid the smoke will endanger the health of the people. Yours,

Leslie, Ingham Co., Mich., Jan. 12, 1881. JAMES WHEATON.

In reply to the foregoing communication from James Wheaton, the advice was to disinfect the house thoroughly with burning sulphur, whatever the decision as to burning the house. The document on the Restriction and Prevention of Diphtheria, and other documents, were sent.

Concerning this outbreak, the following report was received from the health officer:—

Diphtheria made its appearance in the family of Mr. C., in the N. W. corner of the township of Bunkerhill, and there have been six deaths. The oldest one that died was a girl, aged 18 years. At present there are two of Mr. C's children living, but very sick with diphtheria. The disease has not spread from that house.

Respectfully, HENRY STOWEL,

Fitchburgh, Ingham Co., Mich., Jan. 18, 1881. *Health Officer for the Township of Bunkerhill.*

The following communication from Wm. H. Howlett, supervisor, and president of the board of health of Bunkerhill township, Ingham Co., relates to the same outbreak of diphtheria, and well illustrates what information the people generally, and the official guardians of the public health especially, need in the prevention and restriction of contagious diseases, and which it has been the aim of the State Board of Health to supply through its circulars, and in other ways:—

> We are wrestling with a very bad case of diphtheria in this township, and as there is no doctor in this township, and our board of health have had no experience in such cases, and doctors disagree, some saying the house, and bedding, and everything should be destroyed, others that it is unnecessary, and the people are all excited, some demanding of us more than we think proper for us to do, I (as chairman of said board of health) have concluded to write you for counsel. When our board was notified, I was from home, and the other members refused to act without me. On my return I went to see about it, and found that six persons had died and three others were sick (one of whom died since). Notices were posted and the family put under quarantine. We found five beds and bedding lying in the orchard, and on demand of neighbors we ordered them burned; but have refused to burn the old house, although some doctors say it cannot be renovated.
>
> The house is an old log house with frame addition. We have ordered the frame part cleaned and renovated, new clothing and bedding furnished, and the family made as comfortable as possible in said frame part.
>
> Now will you please write me wherein we have failed to do our duty, and what course to take. Is it proper for us to burn the house? and if so, who must pay for it (as the family is poor)? Also, who must pay for the clothing destroyed? If said house must be destroyed, how? By fire on the spot, or by being removed? What is the best disinfectant for such cases? Can carpets be made fit for use after being used in such houses, and how?
>
> The family is Mr. J. C. His nephew went to his house on a visit, was taken sick and soon died. Six of his own children have died. He has one more sick, but we think it will get well.
>
> We feel as if we would like to do all we can for the poor, afflicted parents, therefore I hope you will lend us the aid of your experience and judgment by writing me as soon as possible, giving all the information you can.
>
> WM. H. HOWLETT,
> *Dansville, Ingham Co., Mich., Jan. 25, 1881.* *Supervisor of Bunkerhill Township.*

The following letter from the health officer gives the details of the introduction and course of the disease:—

> I will give you the facts as near as I can. On Dec. 19, 1880, a nephew of the C. family came there and was taken with diphtheria; he died on Dec. 24. Mrs. C. and her oldest son were attacked with the disease on Dec. 28. In a few days four more of the children were sick with diphtheria, Libbie, Willie, Anna, Ina, and Eugenie being the names of the sick. Mrs. C. finally recovered, but not so with the children. Willie died on Jan. 3, 1881. Ina and Eugenie both died Jan. 6; on Jan. 7 the last little boy was taken sick and on the 10th he died, and on the 11th Anna and Libbie died, and thus ended the terrible scourge of diphtheria in the township of Bunkerhill.
>
> I remain yours truly,
> *Fitchburgh, March 1, 1881.* HENRY STOWEL.

In some cases the first intimation of an outbreak of diphtheria received at the office of the State Board has been a report in some newspaper of a large number of deaths from the disease at a place named, the health officer having made no report of the epidemic, or the name and address of no health officer having been returned to this office. Such neglect of a plain duty does not speak well for the efficiency of the local board of health, to whom blanks are supplied from this office every year for the return of the name and address of the health officer. The following communication from the health officer of Clio, Genesee Co., is in reply to a letter calling attention to a newspaper statement that there had been 70 cases of diphtheria, and 14 deaths, at Clio, and enclosing the document on the restriction and prevention of diphtheria. This letter was sent December 17, 1880, the day that a return was received of the name and address of the health officer of Clio, though that return had been due since April, and a blank for the return with a circular demanding it had been sent to the village board of health in April and again in June. The reply indicates a delay in the action of the local board of health, in part due to a lack of information contained in circulars from the State Board of Health. The safety of many lives may depend on having a health officer who knows his powers and duties, who understands means of preventing and restricting communicable diseases, and who has been duly instructed by the local board of health to act promptly on the first notice, information, or observation of a case of a communicable disease. It is not any lack of knowledge concerning official duties, or the fact of asking for such information, but the *delay* in asking for such information from the State Board of Health and in reporting the outbreak, or even in reporting to the State Board the name of the executive officer of the local board, that is censured in the foregoing remarks:

RELATIVE TO THE ACTION OF THE LOCAL BOARD OF HEALTH IN AN OUTBREAK OF DIPHTHERIA AT CLIO, GENESEE CO., MICH.

DEAR SIR:—Yours of the 17th just received. In reply I will state that my attention was called to the subject four weeks since, and I was referred to the law on the subject. I spent some time looking for some law to authorize and guide me in regard to my duty, and not finding anything in the session laws, or anywhere else, I could do no more. Two or three more deaths the past week have renewed the excitement, and one of the village trustees said that one of the physicians told him he thought the board should meet and take action immediately. [!] I saw the president and he was ready to call a meeting, but two members were absent in Detroit. Under such circumstances, and with no law to guide me, I could do no more. I can see no consistency in closing schools and churches, and other public gatherings, so long as the doctors go from houses where they have spent half the night swabbing the throats of four severe cases, to the drug store where the post-office is kept, and where they put up their prescriptions, not ten rods from the place they left, without changing their clothes. If you have any restriction or prevention for such cases, I am ready to act on them, and have been when I have something to guide me.

Yours respectfully,

Clio, Genesee Co., Mich., Dec. 18, 1880. S. C. RICE.

It being reported in a newspaper that the schools in Hesperia, Oceana Co., had been closed on account of diphtheria, that one man had lost four children in three days, and another four within a week, a demand for a special report of the outbreak and of all the measures taken to prevent the spread of the disease was sent to Dr. H. C. Hawley, health officer of Newfield township. The following report was received in reply:—

OUTBREAK OF DIPHTHERIA AT HESPERIA, OCEANA CO., MICH., FEB. 15, 1881.

A Mr. F., of this place, lost five out of seven in his family, and the R. family lost four in their family. I attended the first two that died in this family. They live about four and a half miles from town. The sanitary condition is very bad. The spring out of which they use water for all purposes is at the edge of a small swamp through which the highway runs, is surrounded by small hills, and has no surface outlet; and the stable-yard is on the side of the hill, the drainage all running into the swamp near the spring, and the family is not very cleanly.

The house that the F. family occupied is built on springy ground, and the cellar and the grounds below the house are always wet. The W. C. S. family live about one-half mile from the village, south. They lost six out of their family; had seven. I did not attend this family. House very cold, and the water used by the family is surface-water. Three of the children were buried in one grave, at once. Five in my family have had the diphtheria, and all recovered. I attended very particularly to the sanitary condition, and have with all of the cases that I have had charge of; have had the rooms well ventilated, and use care in giving medicine and applications, never using the same dish for more than the one patient prepared for. * * * From one of my boys I took a sloughed membrane, from each nostril, two and a quarter inches long and as large as could be passed out, very tough and spongy.

I have had forty-three cases, and lost four. The schools have all been closed for some time, but have now commenced again. There are no new cases in this vicinity.

* * * * * * * * * * *

Yours very truly,

DR. H. C. HAWLEY,

Health Officer of Newfield Township, Oceana County.

Hesperia, Oceana Co., Mich., Feb. 15, 1881.

The following report of a malignant outbreak of diphtheria was received from the health officer of Denver township, Newaygo county:—

The scourge, diphtheria, has made its appearance in our midst, in the most fatal form. I cannot trace to contagion. All under middle age are attacked; smaller children die in the initiatory stage, from suffocation from closing of the larynx; older ones die from the septic influence. The membrane is very heavy and the whole tissue of the throat is immensely swollen, causing in many cases opisthotonus. Eyes congested, venous circulation full, dark, and congested. As death approaches the heart's action becomes generally lowered both in volume and frequency, with partial paralysis of the whole pharynx, which shows a tendency to mortification and easily sloughs when caustic gargles are used. From the third to the fifth day the heavily loaded tonsils and pendulous palate shale off the membrane, which usually re-occurs, of a gray and putrid character.

Nothwithstanding the treatment and bathing the whole person with tonic baths, with disinfectants, some of the cases "smell to heaven." The discharges generally are nauseous, and filthy, especially from the nostrils and fauces; pus and sanies often pours forth from not only the nostrils, but the eyes.

I being one of the health board have closely quarantined the cases, but it skips about and is alarming the community. Write me any and all information you may be in possession of, which will aid me, and others also, in this malign disease.

Truly yours,

Hesperia, Oceana Co., Mich., Jan. 6, 1881. DR. L. S. WEAVER.

The following communication relative to an outbreak of diphtheria at the State Institution for the Deaf and Dumb, at Flint, was received from Dr. H. C. Fairbank, of Flint. It is followed immediately by the circular to which it refers:

On my return from New Orleans this week, I went (accompanied by the physician for the Institution, Dr. Clarke), to our Deaf and Dumb Institution, to ascertain, if possible, what local cause gave rise to the recent outbreak of diphtheria among the pupils. After a thorough inspection of the premises I find it quite difficult to arrive at a satisfactory solution of the question. The building and surroundings seem to be in about as good hygienic condition as they can well be; and, as the attending physician suggests, unless the cause be found to lurk in the pipes leading from the privy-vaults, which may have become obstructed (though I could not detect any foul odor from them), the real source of the difficulty may ever remain a mystery.*

I enclose a circular issued by the principal.

I am, very truly, H. C. FAIRBANK,

Flint, Mich., Dec., 17, 1880. *Health Officer.*

The following is the circular referred to, and enclosed by Dr. Fairbank:—

INSTITUTION FOR THE DEAF AND DUMB,
Flint, Mich., Dec. 13th, 1880.

TO PARENTS AND GUARDIANS:—We congratulate you; the diphtheria is disappearing. There have been no new cases for several days, and all who have had the disease have recovered or are in a fair way of recovering. One hundred and ten pupils have been more or less affected with the disease and have been treated. Sixty-two have been clearly marked cases of diphtheria, and many of them very severe, and a few of them as nearly fatal as was ever seen to recover again.

The disease broke out on the 20th of November, and spread throughout the Institution. It was not brought here; it came of itself. Nor can we find any predisposing cause here that would likely produce it. Nevertheless we are having everything that has the appearance of a predisposing cause removed, and the whole premises disinfected as far as possible, and the hospital apartments thoroughly purified. All the pupils are able to go to school this morning but about twenty; but they will all have to be watched for some time to prevent a relapse.

The Dr. says a change of diet, or exposure to the inclemency of the weather would be hazardous, and therefore advises parents not to take their children away. We will have the usual holidays, and amusements, and entertainments, Christmas and New Years, but none of the pupils will go home on that occasion; but any of the parents or friends who may have presents or packages which they wish to send to their children, can transmit them by the express or through the post-office, addressed to the care of the Institution for the Deaf and Dumb, and they will be promptly delivered. Please, however, send nothing which would be unwholesome to invalids.

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*[It seems wonderful that an outbreak of a disease well-known to be a contagious disease should be regarded by any person—more especially by a health officer—as "a mystery," when it spreads through an institution containing many young persons thrown together in classes almost constantly, and occupying for sleeping rooms large rooms in which many children necessarily breathe the same air. Given the entrance to the institution of a single case of diphtheria, even if so mild as to require no treatment, it would seem to be more of "a mystery," if it did not spread through the Institution under such circumstances.—H. B. B., SEC. S. B of H.]

In conclusion we assure you that everything that can be done for the welfare of your children is being done.

Very Respectfully,

THOS. MACINTIRE,

Principal.

The history of the above-mentioned outbreak of diphtheria is given on pages 71–74 of this volume.

PRESENCE OF A CERTAIN FUNGUS, AND COINCIDENT TYPHO-MALARIAL FEVER, ALSO DIPHTHERIA.

DEAR SIR:—I send you to-day by mail a peculiar vegetable belonging to the natural order fungi, and I think of the agaric class. In seasons past these growths have occasionally been found, but this season (since about the first of Aug.) there has been more than ever before as I am informed by the farmers. I have noticed as I have been riding through the country, for the past two months, a terrible stench, sometimes several in the distance of a mile, and had attributed it to small game that the hunter had left lying where he had killed it. But in conversation with a farmer regarding the stench, he said it was caused by a toadstool. That same day I tied my horse and went in search of the cause of the odor, that certainly was as rank as any carrion I ever came in contact with. Guided by the smell, I soon came close enough to observe greenish-bodied flies around a fungus such as I send you. I will give no farther description of it as you can see it for yourself, any more than to state that the bulb that I send with it is the same only not so far developed, and that when the other is farther developed the brown hood becomes more like honey-comb cells, but not so deep, and filled with an excretion like what you see on it now. The older it gets the worse it smells and the more it is frequented by flies. It grows on new ground.

Now this stench has been more than ever was known before, and whether it has anything to do with the cause of the prevailing diseases now is, I believe, a question worthy of investigation. This locality of northern Michigan has always been noted for its almost entire freedom from malarial fevers, although as the soil has been disturbed by the plowman, as expected, intermittent and remittent fevers have showed themselves, but to no great extent. But this year (beginning in July and on the increase yet) these fevers have not been more common, but are prone to linger and assume a typhoid type; they are, in fact, true typho-malarial, I believe, while some of our practitioners believe it to be pure typhoid. Soon as I have time I will give a detailed description of these fevers. They are prevailing all over the country. It is a question if the cause is not in the air charged with the stench above mentioned. Diththeria is very prevalent also in our village.

Respectfully,

Reed City, Osceola Co., Mich., Oct. 16, 1880. E. S. RICHARDSON.

The fungus mentioned in the preceding letter from Dr. E. S. Richardson, proved to belong to the genus *Phallus*, and was probably *Phallus impudicus* ("common stink-horn"). Its general place is found in Cooke and Berkeley's work as follows:

DIVISION I.=SPORIFERA;—FAMILY II.=GASTEROMYCETES;—ORDER VIII.=PHALLOIDEI;—GENUS 63=PHALLUS.

The spores of this fungus have, under the microscope,, an appearance strikingly suggestive of bacteria; particularly as under some circumstances they have a motion of their own; and they are surrounded by a mucilaginous substance which again suggests those lowest forms of vegetable life. The microscopical examination of these spores was made some years ago, as this was not the first time the writer's attention was called to this fungus associated with the occurrence of fever, but nothing definite is yet proved as to any causative relation.

HOW DIPHTHERIA IS SPREAD.

The following letter illustrates how diphtheria may be communicated by persons convalescent from the disease:—

It becomes my duty to report to you that diphtheria has broken out in our township. There have been seven cases in the family of John H., three of which have proved fatal; and one case in the family of James T., which proved fatal. The disease is supposed to have been brought here by Lena H., who had diphtheria at Grand Rapids. After her recovery she came here to T.'s (an old acquaintance) and here was one case which proved fatal. It was not known to be the diphtheria at that time, and was not reported to me until a late date and after the death of four children. I do not know of any more cases at present.

Respectfully, GERMAN BUTTON,

Central Lake, May 27, 1881. *Health Officer of Echo Township, Antrim Co.*

Diphtheria spread because of a disbelief of its contagious character. Seven deaths in the township of South Haven. The health officer's letter is as follows:

There has been an outbreak of diphtheria in the south part of this township, of a peculiar malignant character. Half a dozen families moved into the woods, near the shore of the lake, where Mr. H. had built a saw-mill. The soil is clean sand, no running stream nor swamp within a mile. The disease broke out in the family of David F., attacking a girl aged 10, and a boy aged 8 years. They both died from blood poisoning the 10th day, the boy having all the symptoms of purpura hemorrhagica. Mr. F. lost three children out of five. I attended the family in company with the health officer of the corporation, and we did all in our power to prevent a spread of the disease, by the use of disinfectants, not allowing funerals etc., but as for isolation it was impossible, the people were so incredulous in regard to the danger of contagion. The disease spread till every family had it where there were children, and four more died, making seven deaths in all. I was not called to attend any cases out of Mr. F.'s family, and knew nothing of the other cases officially till the supervisor sent me to the neighborhood to make a canvass of the number of cases, and to see if there were any unsanitary conditions. The physician who attended, willfully neglected to report a single case, I have entered complaint to the prosecuting attorney,—now if he fails to prosecute, what more can I do? I will send you a copy of my canvass of the neighborhood, as soon as I hear from you. I think I can prove that the disease originated from a single mild case that came to board in Mr. F.'s family; a workman that came from a locality where there had been several deaths by diphtheria.

Yours respectfully, M. E. BISHOP, M. D.,

July 19, 1881. *Health Officer of the Township of South Haven, Mich.*

DIPHTHERIA AT ARENAC, BAY CO.

We have had three cases of diphtheria; one malignant case died last week; three families have been exposed. I have taken measures to quarantine those families, and appoint a person to attend to their wants. I thought it advisable to do so and confine the disease to that locality as closely as possible. Where they are is a place known as the plains, the highest elevation in the township of Arenac.

Yours respectfully,

Arenac, Aug. 6, 1881. THOS. R. PALMER.

DIPHTHERIA AT FREMONT CENTER.

Your communication received and contents noted. We have been having a few cases of diphtheria, eleven cases in all, four of which were very malignant. There have been no new cases. We have quarantined the families that were afflicted and followed the instructions of the State Board of Health. We have closed the public schools, and have done all other things possible to prevent the spread of the disease.

Respectfully,

Fremont Center, Sept. 27, 1881. G. W. NAFE.

The distribution of the document on the restriction and prevention of diphtheria is important, as people will act more intelligently with the knowledge it contains than without it. The following letter shows the use made of the document at Hastings:—

Yours of Sept. 23d, with circulars and documents relating to diphtheria, is received. I have distributed the documents and think I will send for more, as I believe that they should be in the hands of every householder in the township.

There have been five cases of diphtheria reported in this township, all children. Two of them have been fatal; one died this morning. The contraction of the disease in every case can be traced to the city of Hastings, where diphtheria has been, and is still, quite prevalent, though I hear that the physicians are having better success in their treatment of the cases for the last week than previously.

I am using every precaution against the spread of the disease in our jurisdiction. I am fearful that as cold weather approaches diphtheria will rage worse than it has, if we do not succeed in stamping it out entirely. If there is any further information in regard to diphtheria I would be glad to receive it.

Yours truly,

WM. H. MERRICK,

Township of Hastings, Sept. 25, 1881. *Chairman Board of Health.*

SUCCESSFUL ISOLATION AND DISINFECTION IN AN EPIDEMIC OF SCARLET FEVER.

The success of measures for the restriction of a contagious disease in one locality indicates what may be done elsewhere by prompt and persistent efforts.

I noticed in the epidemic of scarlatina at Marysville last spring, that the disease was much more frequent among the poorer classes, *i. e.*, among those living under the most unfavorable hygienic surroundings. The disease raged for some time in the village, and a number of deaths occurred, apparently before any attempt was made for its restriction. Then a committee of health was appointed who at once instituted a rigid quarantine and disinfection of the infected families. After this, so far as I have been able to learn, there were no new cases. At any rate the disease quickly disappeared. Very respectfully yours,

St. Clair, Oct. 3, 1881. W. H. SMITH, M. D.

FACTS ON CONTAGIOUSNESS OF DIPHTHERIA, FURNISHED BY E. S. RICHARDSON, M. D., OF REED CITY, MICHIGAN.

In July, 1881, Mrs. S. and her children, of Big Rapids, had Diphtheria in the mild form; in August she visited her sister, Mrs. W., of Reed City, where she stayed a few days, then, in company with Mrs. W., visited another sister in Otisville, then another in Columbiaville. A few days after leaving Reed City, the oldest daughter of Mrs. W. was taken sick with malignant diphtheria. She retired for the night feeling well, a neighbor's daughter, a young lady, sleeping with her, who in about three days was taken sick and died, after lingering two weeks, with diphtheria. In about one week another daughter of Mrs. W.'s came down with diphtheria. Mrs. W. then returned home, and in three days took the disease. Then another of the neighbor's daughters took it and died. In the families where Mrs. S. visited at Otisville and Columbiaville, diphtheria made its appearance. Mrs. S. returned home to Big Rapids, and then went to Grand Rapids, visiting Mrs. R., another sister, where diphtheria again broke ont in a few days after her arrival. Upon my first visit to the daughter of Mrs. W., she told me that she combed her aunt's hair, and observed that her breath emitted a peculiar and very offensive odor, said that her aunt had had diphtheria in Big Rapids, and that she thinks that she took it of her while combing her hair. It is observable that wherever her aunt went diphtheria made its appearance.

PROMPT ACTION BY THE HEALTH OFFICER OF CHEBOYGAN, MICH., IN OUTBREAKS OF DIPHTHERIA AND SMALL-POX. PROSECUTION FOR FAILURE TO REPORT CASES OF DIPHTHERIA.

Your favor of Sept. 20th, sent to the President of this village, was handed me for reply. The village has no health officer appointed. The township of Benton, in which is situated the village of Cheboygan, has always had a health officer, and what has been done in that direction has always been attended to by the township health officer. I have as township health officer since last spring, been attending to those duties for the town and village. We have, it is true, a few cases in mild form of diphtheria, there have been two deaths, children, from diphtheria, and two deaths from secondary causes. The board took immediate measures to prevent, if possible, its spread. It has not at any time been epidemic. The great majority of cases has been severe sore throat with one or two white patches. I had distributed immediately a circular to every house in the township. But the great difficulty I have is to get the physicians to report the cases, although I have provided each physician with blank reports. I also had printed and circulated a "Notice," which contains as you will see, a resolution relative to nuisances, etc., which was generally complied with except in one instance. In that case I sued him for a penalty, and procured a verdict from a jury trial. I have found the situation a very unpleasant one, as heretofore very little, if anything had ever been done in a sanitary way in the township. The township board of health has always heretofore appointed a physician health officer, but getting nothing done by them, it was concluded to appoint some one outside the medical fraternity, for the reason there exists to a great extent ill feeling and jealousy among them at this place. I have just learned that the families in which diphtheria or sore throat occurs, are requesting the attending physician not to report it, for the reason they don't like to have their house placarded with the notice. I intend to complain of the next person offending or refusing to give the notice. We had small pox break out last spring at this place, communicated from the railroad hands, but by active and prompt measures succeeded in confining it to the families in which it broke out, except one family a near neighbor, who took it before the physician could determine what it was. I had the street fenced up at once, placarded the dwellings and placed guards night and day at their respective residences, and as fast as they gave any sign had them promptly conveyed to the pest-house. By that means, and thoroughly disinfecting the dwellings, burning all their clothing, succeeded admirably in preventing its spread.

Yours truly, J. P. SUTTON,

Cheboygan, Mich., October 1, 1881. *Health Officer.*

The foregoing letter was presented to the State Board of Health at its meeting Oct. 11, 1881, and a vote of thanks to Health Officer Sutton was passed.

DIPHTHERIA AT LUDINGTON. MICH., AND MEASURES FOR ITS RESTRICTION.

I received documents this day; thanks. It was the old edition of the document on diphtheria which we procured for circulation. We have had a special police for each ward, whose business it was to see that families who had diphtheria were kept isolated as much as possible and to put up the flag-notices and see that they were kept up so long as there was any danger from the disease or until the health officer permitted them to be taken down; also to keep children off the street, and report every nuisance, etc. The disease having abated very much this police force, after serving about two months, have been discharged. Nothing is left undone by way of isolation of the sick, the using of disinfectants, etc., etc. We have had very little of this disease for the last month, and in fact at one time there was not a case to report, but at present we have four cases, very light,—so light that with one exception they can hardly be said to have it. I lost a case of diphtheria last week, which is the only severe case we have had for a long time. Physicians report their cases now, as they find a complaint will be entered against them at once if they do not. I complained of one a few weeks ago and the result was a fine of one hundred dollars imposed upon him. I am very much obliged for the information received at your hands and for your paper on General Sanitation, *but be assured that I am very sick of diphtheria.*

Very respectfully, A. P. McCONNELL,

Ludington, Sept. 23, 1881. *Health Officer.*

SCARLET FEVER AT SOUTH BLENDON, OTTAWA CO., MICH.

I herewith present a special report of cases of scarlet fever, which disease prevails to a large extent throughout the township. I attribute the spread of the disease to the fact that, 1st, No reports from householders have been received, which may be mostly accounted for by reason of the extreme lightness of the disease and no physicians having been called until a long time after the appearance of the first case. 2d, The board of health, from the above reasons, were not aware of the existence of the fever until a physician had been called and reported. Probably there has been somewhere near 10 or 20 cases, may be more, previous to its becoming known to the board. A slight sore throat preceding the appearance in some cases of a rash or reddish appearance of portions of the skin, an indisposition of perhaps from 1 to 4 days, or more in some cases, constitute the majority of cases so far. The first case, judging from the light we now have, was about Dec. 1, 1880. Within the last 10 days there have been 3 deaths of children under 10 years of age. There is now about 10 cases, to the best of my information. Please send for distribution 20 copies each of the documents, Restriction and Prevention of Scarlet Fever, and Diphtheria; also a few in the Holland and German language, if you have them.

Very respectfully, J. R. HALL,

South Blendon, Jan. 10, 1881. *Health Officer of the Township of Blendon.*

The following letter is printed as showing the nature of advice almost daily sought from this office. The reply immediately follows it:

There are several important matters I wish to lay before our local board of health. I wish for advice in regard to method of procedure. 1. *Township vaccination.* There are a great many here who have never had this operation performed. How is the thing to be brought about? Can the board use compulsory or merely advisory power? What is the usual practice? Give me a plan in full in regard to procuring pure virus, and also the proper manner of reaching the people. Is it proper to hire one physician to do the entire work? If so, what ought his compensation to be? Please write out your instructions fully and plainly. 2. *Burial of the dead.* Does the law specify any particular depth? If so, what, and how are such offenses to be dealt with? Can the board in the absence of law make a regulation thereto and enforce the same, and how? Please state proper depth. 3. Adjoining this village is a dirty old *mill-pond,* polluting the atmosphere for miles around, producing malarial diseases of the worst type. The water has often been drawn off, or nearly so, during the heated term. Can the board fix a low water mark? If so, how should the same be done, and at what point? 4. Filthy, uncleaned privies, villifying God's pure air with their beastly stinks for hundreds of rods around. Is this a matter for notice by the board? If so, how shall they get at it? How shall the board proclaim its desires to the people, and how enforce them? We are somewhat inexperienced in this business, but I intend during the coming year, if within our power, to remedy some of the evils mentioned above.

Answer speedily, for our board will convene soon, and I wish to lay your communication before them in regard to the points above enumerated. Yours truly,

Medina, Mich., April 20, 1881. DR. J. R. DODGE.

To this letter the following reply was made:—

I am in receipt of your letter of April 20, and in reply to your first question relative to *township vaccination*, I would say that the local board of health has power to enforce vaccination only when small-pox actually exists in the township. [Section 1732, Compiled Laws of 1871.] If small-pox does not exist in the township, you can offer vaccination to each person, under the law passed in 1879. The usual practice, I believe, is to offer free vaccination, and for the board to designate some well-qualified physician to do the work, and the sum usually charged is 25 cents, to be paid by the township. * * * * *

In regard to the *depth of graves*:—

There is no law on the subject, but the local board of health of a township can make and enforce a rule requiring graves to be of any desired proper depth. I am convinced that graves are frequently too shallow, and I think six feet should be the minimum depth. Perhaps it would be better in some kinds of soil if they were deeper. They should be so deep that no odor from the body could be detected above the place where it was buried.

In regard to the *mill-pond*:

I would reply that the board can pass a rule, and publish and perhaps enforce a rule requiring the water in a mill-pond to be not lower than a given point, and the low water should be so that no slimy, oozy mud and vegetable material is left uncovered along its banks. If your lawyer tells you such a rule cannot be enforced, it will be proper to apply to the circuit court or judge for an injunction to restrain owners of the dam to such action.

Likewise your board can order filthy privies cleaned, and that no more vaults for privies shall be built, thus compelling persons to use the dry-earth plan, the pail system, or whatever regulation your board may make and publish. * * * * * *

Very respectfully, HENRY B. BAKER,
Secretary.

Lansing, Mich., April 27, 1881.

LEGAL RESPONSIBILITY FOR SELLING GLANDERED HORSES.

The following letter and the legal abstract following it, are of interest:

I send you the accompanying abstract of a trial, which has recently been engaging the attention of a justice's court in St. Johns, Mich., as a contribution to the decision of the question of legal responsibility for selling glandered horses, or those infected with the contagion of glanders.

The abstract was made by Edward L. Walbridge, one of plaintiff's attorneys in the case, in compliance with my request, and an expressed desire by an employee in your office to learn the results of this suit. The trial was hotly contested and lasted for about ten days, and throughout the entire trial the public manifested a deep interest in it, filling the court-room throughout nearly the entire trial.

I gave a copy of your "Report on Glanders" to one of the plaintiff's attorneys, and he acknowledges much assistance from its perusal, and authorizes me to say that you are at liberty to make such use of his brief abstract of the case as you may desire.

De Witt, Mich., Feb. 1, 1881. Respectfully yours, G. W. TOPPING.

IRA F. SCUDDER, vs. JOHN SHAVER. } In Justice Court, before William Brunson, Justice.

Plaintiff appeared by H. and H. E. Walbridge, his attorneys.

Defendant appeared by A. Stout, his attorney.

Plaintiff's declaration sets up a warranty, and alleges an unsoundness, and that the horses are and were infected with the disease of glanders previous to and at the time of the sale.

Action: Trespass on the case for breach of warranty.

Horses were bought on the 7th day of April, A. D. 1880. Price paid for the same, $250.00.

Evidence was introduced showing that said defendant had an old mare that had the acute farcy (glanders), and that said mare was destroyed and burnt up. And these horses that were sold to Scudder ran with the old mare and became infected with the disease. The old mare was killed and burnt up about the 10th of February, 1877. The nigh horse ran at the nose in the spring and summer of 1877, and off horse soon afterward. Evidence was introduced showing that these horses that were sold to Scudder were, while in the possession of Shaver, treated and doctored for this disease, and the growth of the disease checked and kept back, so that it did not make its appearance at the time of the sale, and was not observable by the plaintiff. Second day after being taken home, Scudder observed that the nigh horse had a whistling sound issuing from his nostrils, and when drinking would throw the water out through his nostrils; and in about a week the off horse had a soft, dry cough, and sometime in the month of July commenced running at the left nostril, the discharge being so copious in its flow that the stable is completely besmeared, and one cannot place his hand anywhere without coming in contact with this discharge.

Scudder all the while being ignorant of the character and nature of the disease, and remained so up to the 5th of October. A veterinary surgeon was called in and made an examination, and found them discharging freely at the nostrils; found a cicatrice, or scar, in the left nostril of the nigh horse; the submaxillary glands swollen, and hard, round lumps found upon them along the jole; nostrils of off horse discharging more freely, swollen submaxillary glands, an ulcer in the nostril on the septum, and bare spots over the eyes; soft, dry cough, and roughness of the hair, etc. Color of discharge being of a thick, greenish-yellow.

Suit commenced on the 10th of January, 1880. Jury brought in a verdict of $250.00 for the plaintiff. Defendant appeals the case to the circuit court for the county of Clinton.

SMALL-POX BROUGHT BY IMMIGRANTS.

Small-pox is frequently imported into this State by immigrants. The following letter gives one instance, and also relates to diphtheria, scarlet fever, and typhoid fever at Escanaba, Mich. :—

Yours of last month making inquiries regarding small-pox has been mislaid. But I will answer to the best of my ability. I cannot learn of any very recent cases of small-pox in this vicinity. In June there were a number of cases in this village, ten in all I believe. The disease was imported by Swedish immigrants. There were four deaths. The articles in the paper must have referred to that if they were in this State. We have been suffering from an epidemic of diphtheria, measles, and scarlet fever this fall and winter, the first case of diphtheria occurring in my practice on the 9th of September. Since that time it has raged with great severity. The measles first made their appearance in November, and now to the list we add scarlatina. I have had so much to do for the past five or six months that it was impossible for me to report you our condition of health. I will collect the cases, however, the first leisure day and send them in. Typhoid has been giving us a great deal of trouble also.

Escanaba, Dec. 14, 1880. W. W. MULLIKEN, M. D.

Under date of March 3, 1881, in speaking of diphtheria in Sheridan township, Mecosta Co., John A. Markle, Supervisor, says:—

Diphtheria has broken out in this town. There are now two bad cases. One doctor says it is scarlet fever, another says it is diphtheria—either is bad. The board of health put up notices of the disease, warning people to keep away as much as possible, so as not to spread the disease, and those that did go to disinfect their clothing on leaving. The people here thought such a notice an outrage. Was it right or not? We have been very healthy in this locality, but now disease is breaking out, and *almost every one is having sore throat.* This is a new country, and some people don't keep their premises as clean as they might.

We should be pleased to hear from you, and glad of any advice or recommendations you have to offer as regards our duty in keeping the disease at bay.

Dr. Ross, of Rome, Mich., in a letter dated March 14, 1881, in speaking of scarlet fever, says:—

"By allowing no public funeral, and by keeping strict surveillance over the inmates of the infected house, we prevented a spread of the disease."

Under date of April 20, 1881, in reference to an epidemic of measles, occurring in Somerset Center, Hillsdale Co., Dr. R. C. Traver, health officer, writes as follows:—

We have in this vicinity, and through this township, generally, an epidemic of measles, but of very mild type, that has visited nearly every house. The inhabitants have employed no physician as a general thing, and have neglected to report all of the cases.

Geo. W. Orr, M, D., Central Mine, Keweenaw Co., writes, under date of April 25, 1881, as follows:—

We have had a run of pneumonitis among children, also measles and scarlet fever. All inflammatory diseases are unusually severe this spring.

The following summary of cases of diphtheria occurring in the township of Porter, Midland Co., is made from the report of Robert Potter, health officer, and supervisor of the township, dated May 21, 1881:—

Nineteen cases and nine deaths occurred between Aug. 20 and Nov. 2. The sickness was confined to seven families, six cases occurring in one family, and three in each of three others.

The disease made its first appearance Aug. 20, in the Oliver family, six of whom were down between this date and Sept. 15, with three deaths (aged 14, 18, and 21 years.) No cause is known for these cases, the supervisor reports, except that the family lived in an old and decayed house. All the other cases can be traced to exposure. To the Mosier family, three of whom sickened and died between Oct. 26 and Nov. 2, the infection was brought in clothing from the Dooson family, three members of which had been sick with diphtheria and recovered between Sept. 25 and Oct. 30. *The general course of the disease was from the southwest to the northeast*, those living southwest having a great deal of diphtheria before we had any.

Measures employed to disinfect material infected by scarlet fever at Pontiac,—reported by W. G. Elliott, M. D., health officer, May 28, 1881:—

In your last you ask, "What means are taken to disinfect?" In scarlet fever, burning all waste and useless articles, boiling and fumigating by burning sulphur, removing the paper from the room and whitewashing with carbolic acid added to the wash, in all cases where it has been possible. But few cases are reported, as many of the physicians deny its existence since their arrest. To prevent further arrest they call it anything but the right name. It has been very mild in a majority of the cases. Many children have broken out in school. Nephritis has occurred in a few cases, but one sudden death in a family where two cases of what was called "Roseola" occurred. It has diminished very much in the last few days of hot dry weather.

Diphtheria at Manchester, Mich., Sept. 7, 1881:—

There are two cases of diphtheria in one family on main (Exchange) st., in one of the principal business houses. The family live in the second story *over the store*. Two were sick and one died to-day,—a young lady aged about 20 or 22. These are *the first cases* we have had in this place for many years. Yours respectfully, A. C. TAYLOR, M. D.

RELATIVE TO PNEUMONIA AT MANCHESTER, MICH.

Sickness, with the exceptions of intermitting and remitting fevers, is abating somewhat. I have seen, through the months of April and May, an unusual number of cases of pneumonia, and have marked a peculiarity in many of the cases that I have seen, both in my own and in the practice of others. 1st. Some of the cases have seemed to begin as a simple remitting fever, having all the symptoms of the latter disease, with none of the former (pneumonia) for several (3-7) days, when a pneumonia would gradually develop itself, without any premonitory chill, but with a gradual rise of temperature, run an uninterrupted course, and end in recovery.

2d. There has been an unusual tendency to delirium in cases of pneumonia, nor has this symptom been in all cases due to either a sudden or great rise in body temperature. Fully 50 per cent of the cases have had this symptom in a marked degree, in some of whom the temperature never rose above 102⅕°.

Of course this may have been only a co-incidence, but never having remarked it to such a degree before, my attention was fixed upon it as perhaps indicating a tendency to meningitis, as I have also seen during the past year a tendency to spinal inflammation in all febrile complaints in children, some of whom were left with partial paralysis of lower extremities.

If your attention has been called to this matter in any other locality, I would be pleased to know of it, as I wish to know if I am mistaken in my views or not.

Manchester, Mich., May 23, 1881. Very respectfully, A. C. TAYLOR, M. D.

CONCERNING AN OUTBREAK OF CEREBRO-SPINAL MENINGITIS, AT JACKSON, MICH.

Since March, this year has been very much different from the preceding years since my residence here. There has been a much larger amount of sickness, together with the greatest amount of ill feeling amongst those calling themselves "well," that is, going about their daily vocations. In this latter it has exceeded anything that I have witnessed for many years.

Early in March the epidemic of cerebro-spinal meningitis struck and has prevailed ever since. The first part of the epidemic was quite fatal, and the mortality has run high right up to the present, although the cases are on the whole of a less severe type. The mortality cannot be entirely laid to the disease, of this I am very confident, so that we would perhaps do the malady,—bad though it is,—an injustice in this respect.

It has been almost invariably marked during this epidemic with sore throat, and in some instances with an intensely painful catarrhal inflammation of the schneiderian membrane with offensive sanguino-purulent discharge. The rash was not at all constant, I saw it only a very few times; in some cases, five or six of mine, there was lung complication, with occasional paroxysms of pain and dyspnœa lasting several weeks after.

I had two cases commencing with almost complete motor paralysis, attended with, in one case, mania, lasting several hours, in the other paroxysmally so for the first 24 hours. Quite a number set in with convulsions, and most of them with chill and vomiting; the bowels were generally acted upon without much trouble, the evacuations being of dark, offensive character. These are, I think, the symptoms which seemed characteristic of this epidemic, the others were similar to the disease as you ordinarily see it.

You will observe that our ordinary spring remittent has been absent almost entirely in this locality, and even now there is very little.

Lung troubles have not been so prevalent this year as last, during the spring months.

The change in weekly report to which I called your attention a few weeks ago was, the sudden supervention of diarrhœa, cholera-morbus, cholera-infantum (card of June 16th), somewhat earlier than usual, and so general as to take first places, almost. This was peculiar also with intermittent at that time and with cerebro-spinal meningitis, being a fresh exacerbation of the latter.

Yours Respectfully, W. WORSFOLD.

Jackson, Mich., July 23, 1881.

DIPHTHERIA IN FREDERIC TOWNSHIP, CRAWFORD COUNTY, MICH.

In response to the following telegram received by the Secretary, J. W. Hauxhurst, M. D., of West Bay City, was requested to go, because of his nearness to the locality and because of confidence in his ability to check diphtheria, he having been health officer of West Bay City. Dr. Hauxhurst's report immediately follows the telegram.

[Telegram.]

Please send to Forest physician for diphtheria. Can't check it. Answer immediately.

J. F. HULL,
Health Officer, Township of Frederic.

DEAR DOCTOR: I am able to report as follows concerning the outbreak of diphtheria in Frederic township, Crawford Co., and to which place I went June 23, in response to your telegram the day before.

There occurred in this township nine cases of diphtheria in the term of three weeks, eight of which were in the village of Fredericville, two of which cases were dead and interred before my arrival, a third beyond medical aid—dying the next day; four had already recovered, and one, a not unusually severe case, terminated favorably under treatment during the week immediately after the 23d of June.

The ninth and last case, which was fatal, occurred in the settlement east of the village, after my return.

I send you a diagram of the village of Fredericville, and it will show you the starting point of the disease, as well as the course of its spreading.

The house marked (1) is where the first case appeared, and the only one in this family. It then appeared at (2), (one case); then at (3), (three cases); then at (4), (one case); then at (5), (one case); again at (6), the eighth and last case in the village.

As to its origin: About the 27th of May there moved into the house (1), a family from Roscommon, and two weeks afterward their child was sick with diphtheria. The families of (2) and (3) communicated with and assisted (1), and after a few days the disease appeared at (2), and immediately afterward at (3.) Then (4) and (5) communicated with (3), and soon afterward each was afflicted with one case—both children. About fifteen days from the appearance of the first case at (1), the eighth and last appeared at (6). The case in the settlement east had communicated with (3). Diphtheria had prevailed at Roscommon, and I am satisfied it was transported from this place to Fredericville.

Its spreading can only be accounted for by its contagious nature. The soil at Fredericville is sandy, with no subsoil. There are no stagnant pools—no sources of contamination whatsoever that I could discover, either within or immediately without the village limits. I am therefore convinced that the disease did not originate *de novo* at this place.

There being but one patient with the disease on my arrival, I found my services needed more in the direction of prophylaxis, and as a sanitarian than as a physician to cure. I therefore caused an immediate meeting of the board of health at the school-house, and with them came together twenty or more men of the village. Having laid before them the Board's duties as health preservers, and its powers as provided by law, I gave them practical instruction in methods of disinfection, and particularly with the use of chloride of lime and muriatic acid in generating chlorine gas. I caused these to be provided in generous quantity to every house in the village, and secured promises from inmates that they would be thoroughly used. Where the disease had already occurred I insisted upon the board's duty to assume the right to attend to the details of disinfection. I likewise advised the school closed, no unnecessary communication between families, and no borrowing or lending of household utensils or furniture.

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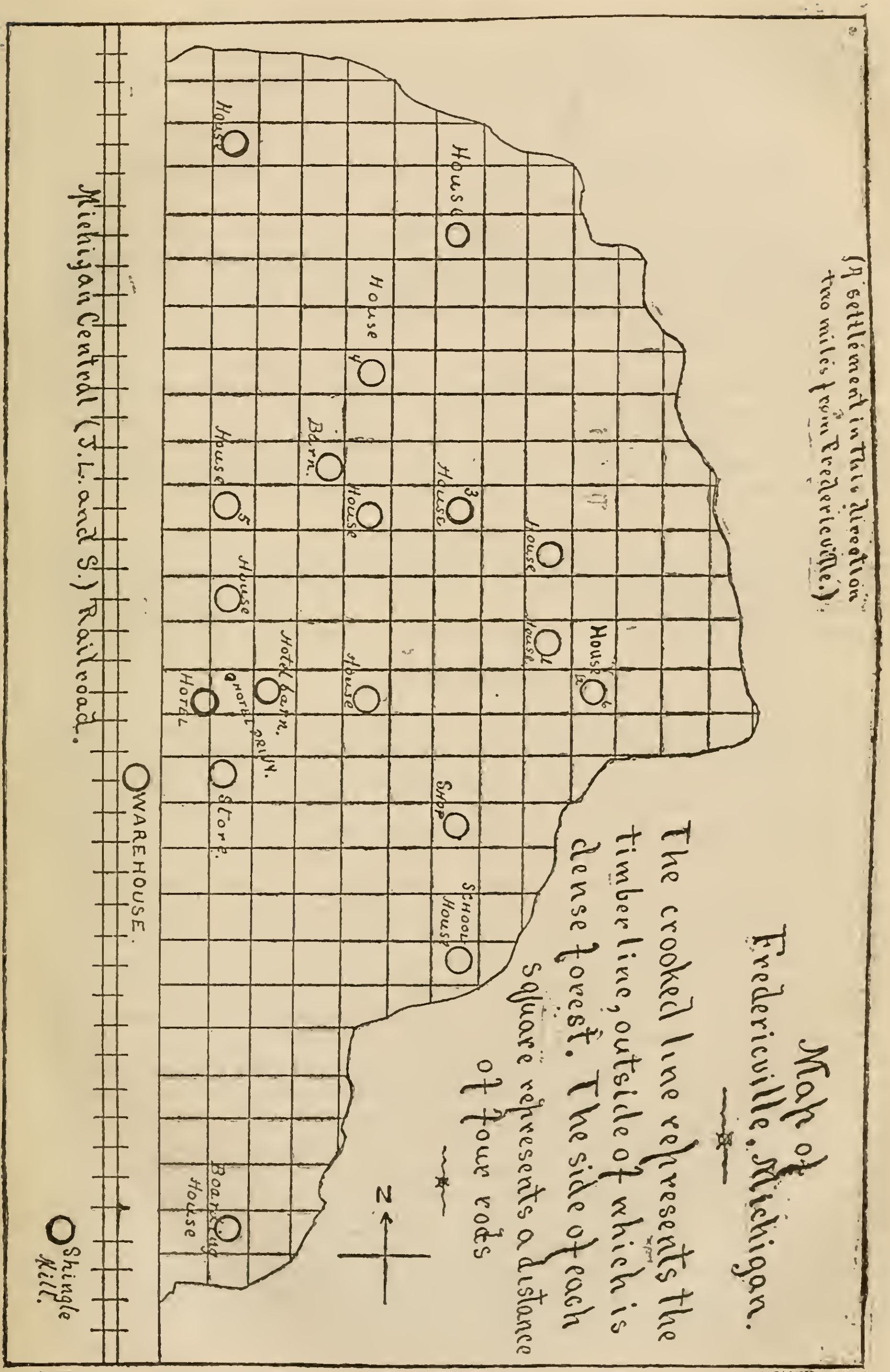
* [The portions omitted relate to medical treatment, which has not been allowed a place in this Report, even though, as in this case, it relates to treatment designed to be preventive of the disease.—H. B. B., Sec. S. B. of H.]



Map of Fredericville, Michigan.

The crooked line represents the timber line, outside of which is dense forest. The side of each square represents a distance of four rods

Two weeks have now elapsed since my return, and no new cases have occurred except the one in the settlement already mentioned.

In concluding, I beg to hope that my services have met what was expected of me by Frederick Township, and that they will reflect no disappointment upon your Board, and especially to yourself, who was instrumental in sending me.

I am, Doctor, yours truly,

J. W. HAUXHURST, M. D.

POISONING BY EATING APPLE JELLY MADE IN COPPER VESSELS.

The following letter explains itself:—

I send you to-day a sample of apple jelly which has poisoned seven in one family. I saw the family on Dec. 14, 1880. The symptoms were as follows: Vomiting, purging, the discharge from the bowels was of a dark color, cramps in the stomach, dizziness, great thirst. The vomiting has continued for three days. The four children are all just alike. There is some paralysis. I think the family will recover. The jelly was made in copper pans by a man at Newburg. I would like to hear from you as soon as possible.

Gaines, Mich., Dec. 16, 1880. J. MARSHALL, M. D.

The jelly was referred to Prof. Kedzie, committee on poisons, etc., and he made the following report:—

The specimen of apple jelly submitted to me for analysis to determine the cause of its poisonous properties has been analyzed, and I find it contains zinc in quantity equal to three grains of crystals of the sulphate of zinc in each ounce of jelly, the zinc existing as an organic salt, probably the malate of zinc.

If the jelly was made in a zinc vessel, such as a galvanized sap pan, it would be easy to explain the presence of a salt of zinc in such jelly. The public need to understand that zinc salts are dangerous; that they are readily formed when acid fruits are cooked for a long time in zinc vessels; and that galvanized iron is safe to use only in connection with neutral liquids, such as maple sap as it first comes from the tree.

R. C. KEDZIE,

Lansing, Dec. 31, 1880. *Chairman of Com. on Foods, Drinks, and Water Supply.*

HOG CHOLERA.

At the October (1880) meeting of the State Board of Health I was directed to investigate the hog cholera, then prevailing in the southwestern part of this State, and to find, if possible, any relation between that disease and any sickness in the human family. In pursuance of that order I visited Vicksburg, in Kalamazoo county, Mendon and Wasepi, and their vicinities in St. Joseph county, and Climax and Leroy in Calhoun county, pursuing my investigations more particularly in the latter township. The statements given below are the conclusions arrived at by me from a collation and comparison of facts obtained, sometimes with the greatest difficulty, in the localities above named, as many of the people do not recognize the disease as hog cholera, and in many instances were unwilling to furnish any information, or aid in an investigation.

The disease prevails in all the above named localities, and the general impression seems to be that it is spreading east and north. This chances to be in the direction of the prevailing winds, and some are of the opinion that the winds favor its spread. It should be remembered, however, that inasmuch as the disease first struck the southwestern part of the State, if it spread at all in Michigan it must necessarily be in that direction. Still the theory of spread by the wind is worthy of consideration, especially as the cause is known, and appears to be capable of being carried as dust by the wind. Another thing, previously known, was that the disease is communicable. It has also been ascertained that it could be communicated to mice, sheep, and chickens, and from each of these back again to the swine, although the disease affected sheep but slightly. I have found evidence in my recent investigations that it may also be communicated to rats, dogs, lambs, colts, and cats.

NATURE OF THE DISEASE.

The term "cholera" is a misnomer except as it conveys an idea of a communicable disease. Contagious typhoid pneumonia would more nearly represent the nature of the disease, but both those terms would probably be misleading unless the mode of communication of the disease be understood, which is by inoculation or by taking the specific virus into the body with the food. It is possible that the disease may be communicated by inhaling the poison, but of this there is not sufficient evidence.

The time which elapses after the entrance of the poison before the disease is noticed is about seven days, but it varies considerably, possibly depending upon the amount of poison introduced and the susceptibility of the system to it. Young animals are most susceptible, and the mortality is greatest among them. The evidence of this was very marked in my investigations. This is exactly analogous to the communicability of diseases which affect human beings, such as scarlet fever, measles, diphtheria, etc. Some of those who had observed the disease in Leroy township thought it was certainly diphtheria of the hog. I found in other places mention of swelling of the throat and difficulty in swallowing. Post mortem examinations did not reveal signs of diphtheria, however, but did reveal evidence of hog cholera.

THE SYMPTOMS

described in various places varied greatly, but are all easily explained when the nature of the disease is understood. The specific virus circulates through the body wherever the blood goes, and very rapidly reproduces itself. It tends to clog up the smaller blood-vessels throughout the body, and especially in any weak or injured place; therefore the symptoms necessarily differ widely, but the lungs almost uniformly suffer, becoming clogged up in nodules or by entire lobes, in many instances causing death in this manner. Another part of the body next most constantly affected is the large intestine and small intestine near it. Where the glands on the inside of the intestine are enlarged and sometimes ulcerated and inflamed, the adjacent lymphatic glands are enlarged, and the stomach is sometimes inflamed. In one case I noticed enlarged spleen, and the liver had a peculiar purplish appearance. Others have found similar appearances.

From this description it is easily realized that there is not much hope in medicine being able to eradicate the disease, but as a matter of fact the farmers are imposed upon all over the country by quacks, and are trying all kinds of remedies. But what is found to answer in one case will not work in the next, indicating that there is no reliance to be placed upon remedies. On the contrary it is productive of much mischief, as the attempt to keep the animal alive only tends to increase the cause of the disease. Intelligent men say if they had killed all the first animals attacked and placed them four feet under ground it would have been money in their pockets by preventing the spread of the disease, but the question of its restriction is very complex, because of its existence among almost all classes of animals, and perhaps in human beings.

The disease is not generally recognized by the people where I went. They say, when cats have a disease which appears to me the same, that it is consumption. When the dogs had it, it was "dog distemper;" when the colts had it, it was "epizoötic;" and when the lambs had it, as they did in some places, they attributed it to feeding on clover, or called it "grub in the head," and cited for proof the fact that after death the "grubs came out of the nose;"

but this might occur in summer after death from any disease. The disease is probably spread very largely by mice, rats, and cats, which die and lie around unobserved, and to which chickens and hogs have access.

The question which I was especially requested to investigate, whether this disease is communicable to man, is attended with much difficulty, because in the neighborhoods were it exists, the people are very much afraid, and avoid contact with the disease or eating the meat; but at nearly every point they ship animals of this character, and purchasers only require that the animal shall be alive when put on the cars. They go from there to Chicago, Detroit, and perhaps to other places, and the difficulty lies in deciding just which pork belongs to animals of that kind. One reason prompting this investigation was that sickness, and in one case death, was attributed to eating sugar-cured ham in which careful search proved the absence of trichina. It has been found that the poison of the disease is somewhat easily destroyed, but whether meat from animals which have died of this disease is capable of conveying the disease to human beings who eat it as it is ordinarily prepared is a question of very great importance, but one upon which conclusive evidence cannot yet be obtained. I found one place where the first animals known to be sick were two cats. The next were the chickens which died very rapidly, and the next was the man of the house, whose symptoms, as described, were not very different from those of the animals. The next were the hogs, not all of which were dead at the time of my visit. One was killed, and a post mortem revealed hog cholera, every point being verified under my eyes. At the time of this visit a son, the only male member of the family remaining, was sick. Whether his sickness bore any relation to the other disease it will be impossible to say, if he lives; should he die, post mortem might determine the point. Further investigation will be greatly facilitated if persons having any knowledge on this subject will kindly communicate it to the Secretary of the State Board of Health, Lansing, Mich.

"WINTER CHOLERA."

This disease it was thought, might bear a relation to hog cholera or to the use of food-products derived from hogs suffering from the disease.

Reports for the week ending Feb. 5, 1881, showed diarrhea present at Niles, St. Joseph, Mendon, Coldwater, Hillsdale, Brooklyn, Wyandotte, Ionia, Marquette, Houghton, Grand Rapids, Muskegon, Bay City, East Saginaw, Paw Paw, Hudson, Three Rivers, and Washington.

An effort was made to learn the relation, if possible, between this outbreak of diarrhea and the eating of lard, or pork from Chicago. Questions were also put in the annual circular to correspondents with the view of determining the relation between hog cholera and sickness in man, but the evidence is not of a positive character. The replies to the questions referred to are summarized on pages 265–6 of this Report. In addition to those, the following communications have been received:

Dr. Edwin Stewart, of Mendon, under date of March 15, 1881, says:—

> "I could not trace any relation between the winter cholera and the use of pork and lard."

The following letter from Dr. Ross does not connect the sickness with food:—

> I also wish to call your attention to the fact, *that within the last two weeks we have had an unusually large number of cases of choleraic diarrhœa*, or what is frequently styled in this region cholera morbus. Have had seven very severe cases, besides several less severe. *In my fifteen years' residence in this place I have never seen anything like it in the winter season.* I can find no attributable cause. The papers state that in *Chicago it is attributed to butterine and oleomargarine*, but there

is *no consumption of either article in this township.* It now appears to be wholly owing to unrecognized atmospheric causes. If it prevails to any considerable extent throughout the State, may it not be regarded as prognostic for the coming year. Very respectfully, E. J. ROSS,

Rome, Lenawee Co., Mich., March 14, 1881. *Health Officer.*

In reply to a question as to the first case of winter-cholera which, with many, occurred in Hotel ———, in Flint, the health officer said:—

In reply to yours of April 21, will say that the first case of "winter cholera" at the hotel occurred in a man three days after leaving Chicago. The hotels here have used *ice* from a mill-pond in the Flint river above the city but a short distance, which pond is generally full of pine logs. Very truly,

Flint, April 25, 1881. H. C. FAIRBANK.

In reply to a letter from this office, Dr. Goodwin, of Cassopolis, wrote as follows:—

Yours of April 23 is received, and in reply would say: I think it is a mistake about there being any hog cholera in this vicinity. I am daily in various directions out of town from three to ten miles, and had heard nothing of it, and since the receipt of your letter I have taken pains to inquire of every farmer I have met and have not found a single case. There has been a great loss of bees through this county. In many cases every stand has perished. One man has only eight colonies from one hundred and fifteen. During February and March I had quite a number of cases we called *winter cholera.* There would be severe vomiting and exhaustion, high fever, great thirst, with alternate chills and cold extremities, and dark discharges mixed with undigested food; pain in the bowels; urine scanty and high-colored,—but all recovered in two or three days. There has been more lung difficulties during the past winter than usual, quite a number resulting fatally. Should there be any outbreak of hog cholera here I would let you know.

Yours,

Cassopolis, May 3, 1881. F. GOODWIN.

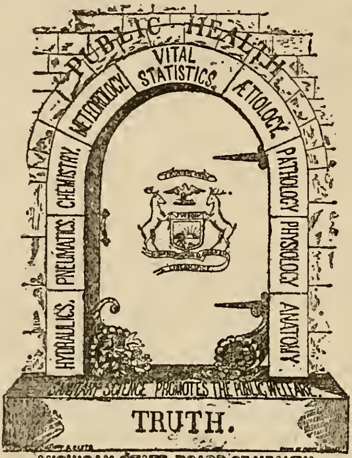
REPORT OF SPECIAL COMMITTEE TO DESIGN A SEAL FOR THE STATE BOARD OF HEALTH.

Mr. President, and Members of the Board:—Some of the ideas which I have endeavored to have the design, which I now submit to you, suggest, are as follows: Based upon and springing from a solid foundation in truth are the physical and biological sciences which contribute to the upbuilding of sanitary science. Prominent among these sciences, out of which sanitary science has arisen and which still constitute its chief parts, are: Hydraulics, pneumatics, chemistry, meteorology, anatomy, physiology, pathology, etiology, and vital statistics. Other branches of learning contribute; and there are now many subdivisions of sanitary science, as, for instance, sanitary engineering (which also is subdivided), restrictive sanitation respecting the communicable diseases, etc. But it is a long time since the present emblem of hygiene (the goddess Hygeia feeding a snake) has had any claim, except as an exceedingly remote ancestor, to represent even private hygiene, much less public hygiene; and to continue to use that emblem seems to me about as appropriate as to place upon one's family coat-of-arms a representation of one of our supposed Simian ancestors. In designing the seal, therefore, I have tried to represent something less remote than the emblem so long employed, and to include, symbolically at least, references to some of the most important immediate ancestors of sanitary science,—those which are yet living, and whose activities still animate the new science which promises so much for human progress and happiness.

The design which I offer may suggest that as yet we are only at the portal, and cannot see more than what lies at the entrance upon public-health work; and yet, upon the threshold we find evidence that "Health is Wealth,"—

that it brings plenty. The truth seems to be that health is more than wealth, for health is happiness. In this design, then, the motto is: *"Sanitary Science Promotes the Public Welfare."*

Respectfully submitted, Henry B. Baker.



MICHIGAN STATE BOARD OF HEALTH SEAL.

AUXILIARY SANITARY ASSOCIATIONS.

In a letter dated Sept. 15, 1881, Dr. C. H. Maxim, Secretary of the Grand Rapids Sanitary Association, says:

> "Our Association is putting in steady and persistent work, meeting every two weeks and having a good paper on some sanitary topic each meeting, always followed by interesting and profitable discussions,—and we feel that it is having a good influence on the sanitary condition of the town."

COMMUNICATIONS REFERRED TO COMMITTEES.

Under a resolution printed on page xlviii of the Report for 1880, communications have been referred to members of the Board, as follows:—

To R. C. Kedzie, M. D.,—
  From J. D. Hayes, relative to grape sugar.
  From Prof. S. P. Sharples, relative to analyses of sugar and syrup.
To Henry F. Lyster, M. D.,—
  From Stephen Smith, M. D., relative to quarantine at New York.
To Hon. Le Roy Parker,—
  From Wm. E. Mackey, J. P., relative to abatement of a house of ill fame.
To J. H, Kellogg, M. D.,—
  From C. H. Voute, relative to work done by an odorless excavator in Michigan.
To Arthur Hazlewood, M. D.,—
  From D. T. Lawson, relative to boiler-explosions.
To Hon. John Avery, M. D.—
  From Mrs. Eliza Leggett, relative to use of tea, tobacco, etc.

This Ninth Annual Report is respectfully submitted.

HENRY B. BAKER,
Secretary.

PROCEEDINGS AND ADDRESSES

AT THE

SANITARY CONVENTION

AT FLINT, MICHIGAN,

HELD UNDER THE AUSPICES OF THE

STATE BOARD OF HEALTH,

AT FENTON HALL, JANUARY 25 AND 26, 1881.

SANITARY CONVENTION AT FLINT.

For this convention the following circular of announcement was issued:

SANITARY CONVENTION AT FLINT, MICHIGAN, UNDER THE AUSPICES OF THE STATE BOARD OF HEALTH,

In accordance with invitation received from citizens of Flint, arrangements having been made by a local committee of citizens of Flint, acting with a committee of the State Board of Health.

TIME AND PLACE.

A Sanitary Convention will be held at City Hall,* in Flint, Michigan, on January 25 and 26, 1881.

SESSIONS.

There will be sessions the first day at 2 P. M. and 7 P. M.; on the second day at 10 A. M., 2 P. M., and 7 P. M.

During each session of the convention there will be one or more addresses or papers on some subject of general interest pertaining to public health, each paper to be followed by a discussion of the subject treated.

OFFICERS OF THE CONVENTION.

The officers chosen by the committee are as follows:—

Hon. Geo. H. Durand, President, Flint.
Hon. James Shearer, First Vice-President, Bay City.
Hon. John Moore, Second Vice-President, Saginaw.
Hon. John T. Rich, Third Vice-President, Lapeer.
J. B. Atwood, Fourth Vice-President, Flint.
Hon. James M. Turner, Fifth Vice-President, Lansing.
Dr. F. B. Galbraith, Sixth Vice-President, Pontiac.
Bela Cogshall, M. D., Secretary, Flint.

EXHIBITION OF SANITARY APPARATUS.

Manufacturers of and dealers in all kinds of sanitary apparatus or appliances, are invited to send specimens of their articles for exhibition at these conventions in accordance with the following regulations:

(*a*) The committee reserves the right to decline any article not deemed suitable.

(*b*) A full description of each article proposed to be exhibited must be forwarded to the secretary of the convention with the application for space.

(*c*) There will be no charge to exhibitors for entrance fee or for floor or wall space.

(*d*) Exhibitors will pay all expenses of transportation, storage, placing and removal of goods, and must themselves be responsible for any breakage or damage to their articles.

(*e*) Every article, model, drawing, or photograph exhibited must bear a descriptive label giving a detailed statement respecting its construction, use, and the price at which it can be furnished, and the name and address of the agent, and place of sale.

(*f*) Exhibitors may employ persons to explain their exhibits, and, properly, to solicit orders.

(*g*) The position in the hall, of articles entered by each exhibitor, will be determined by the secretary of the convention.

(*h*) Exhibits will be received by the secretary of the convention until January 21, 1881, and will be placed in the hall before the opening session of the convention.

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* [Afterwards changed to Fenton Hall.]

Judges will be appointed to examine the various articles on exhibition, and certificates of merit will be awarded to such articles as are deemed worthy.

Records of the proceedings of this convention will probably be published in the Annual Report of the State Board of Health.

The admission to all sessions of this convention will be free, and the public are cordially invited. Programs for the sessions of the convention will be issued at an early day.

ADDRESSES AND SUBJECTS TO BE PRESENTED AND DISCUSSED.

1. Welcoming address, by the Mayor, Hon. Zach. Chase.
2. Speech by the president of the convention, Hon. Geo. H. Durand.
3. Domestic Sanitation.
4. Pure Air in Dwellings.
5. Sewerage and its Adjuncts.
6. Forests and Trees as Sanitary Factors.
7. Some of the Dangers incident to Pioneer Life.
8. Sanitary Associations, including a Report of the Sanitary Association at Grand Rapids, Michigan.

Other subjects will be announced hereafter.

You are cordially invited to be present at the sessions of this convention.

The Chicago and Grand Trunk Railway Company will sell tickets to persons who wish to attend the convention at two cents per mile each way, application for certificate to be made to the local secretary.

The secretary of the convention will be pleased to give any further information. He may be addressed at Flint, Michigan.

BELA COGSHALL, M. D., *Secretary.*
Flint, Michigan,

LOCAL COMMITTEE.

H. C. Fairbank, M. D., Hon. LeRoy Parker, Hon. A. L. Aldrich, Bela Cogshall, M. D., Rev. James Venning, J. B. Atwood.

COMMITTEE FROM THE STATE BOARD OF HEALTH.

Rev. D. C. Jacokes, Prof. Edwin A. Strong, Henry B. Baker, M. D.

[Another sanitary convention will be held this Winter. Communications may be addressed to the State Board of Health, Lansing, Michigan.]

PROGRAM OF THE SANITARY CONVENTION TO BE HELD AT FLINT, MICH., JAN. 25 AND 26, 1881.

First Session.—Tuesday, January 25, 2 P. M.

1. Convention called to order by the Secretary.
2. Prayer—By Rev. Luther Lee, D. D., of Flint.
3. Address of welcome—By Hon. Z. Chase, Mayor of the city.
4. Introductory remarks; Statement of the purposes of the convention—By Prof. R. C. Kedzie, M. D., of Lansing, President of the State Board of Health.
5. Opening address—By Hon. George H. Durand, of Flint, President of the convention.
6. Appointment of committees, etc.
7. A paper—Domestic Sanitation, by J. H. Kellogg, M. D., of Battle Creek.
8. Discussion of the subject.
9. A paper—Sewerage and its Adjuncts, by Daniel Clark, M. D., of Flint.
10. General discussion.

Second Session.—Tuesday Evening, January 25, 7 P. M.

1. Reading of the minutes of previous session.
2. A paper—Intemperance as a Cause of Destruction of Human Life, by Mrs. E. Clark, President W. C. T. U. of Flint.
3. Discussion—Five minute speeches.
4. Address—The Relations of Sanitation to Christianity, by Rev. Chas. H. W. Stocking, D. D., of Detroit.
5. General discussion of the subject.

Third Session.—Wednesday, January 26, 9:30 A. M.

1. Reading of the minutes of previous session.
2. Prayer—By Rev. C. J. Thompson, of Flint.
3. A paper—On Some of the Dangers to Health Attending Pioneer Life, by A. W. Nicholson, M. D., of Otisville.
4. Discussion of the subject.
5. A paper—Importance of Domestic Sanitation, by J. H. Jerome, M. D., of Saginaw City.
6. Discussion of the subject.

7. A paper—Force Values of Foods, by Prof. Victor C. Vaughan, M. D., Ph. D., of Ann Arbor.
8. General discussion.

At 1 o'clock P. M., January 26, a visit to the Deaf and Dumb Institute; Examination of the workings of the institution, ventilation of the buildings, etc.

Fourth Session.—Wednesday, January 26, 3 P. M.

1. Reading of the minutes of previous session.
2. A paper—A New Board of Health for Detroit, by Prof. Henry F. Lyster, A. M., M. D., of Detroit.
3. General discussion.
4. A paper—Forests and Trees as Sanitary Factors, by John S. Caulkins, M. D., of Thornville.
5. Discussion of the subject of the paper.
6. Volunteer papers and discussions.

Fifth Session.—Wednesday Evening, January 26, 7 P. M.

1. Reading of the minutes of previous session.
2. Miscellaneous business, reports of committees, resolutions, etc.
3. Sanitary Associations, including a Report of the Grand Rapids Sanitary Association, by the Rt. Rev. Geo. D. Gillespie.
4. Discussion of the subject.
5. An address—Pure Air in Our Dwellings, by Rev. D. C. Jacokes, D. D., of Pontiac.
6. Discussion of the subject.
7. A paper—Is the Work Done in Our Public Schools Detrimental to the Health of the Pupils? By Prof. M. T. Gass, of Flint.
8. Discussion of the subject of the paper.
9. Closing of the convention.

FIRST SESSION, JANUARY 25, AT 2 P. M.

The first session was called to order by the secretary of the convention, who introduced the Rev. Luther Lee, D. D., who offered prayer for the successful outcome of the convention.

H. C. Fairbank, M. D., chairman of the local committee, in a few appropriate remarks, introduced the Hon. Zach. Chase, who made the following welcoming address:

MAYOR'S WELCOMING ADDRESS.

BY HON. ZACH. CHASE.

Gentlemen of the Medical Profession and Friends:—In behalf of the citizens of our city, it is my pleasant duty to welcome you here, and to extend to you our hospitality.

I can say then, we cordially welcome you. I am pleased that Flint has been selected for this meeting, and am sure that the citizens of our city appreciate the fact that you have selected this place, and am as well assured that we shall all be profited by it.

I learn that the original meaning of the word *doctor* was *teacher*, and if I mistake not, the object of this meeting is to teach; that by an exchange of views we all, both physicians and laymen (if I may use that term for non-professionals) may learn something, and I know of no subject that is of such vital importance to us all as sanitation, the laws of health, and how to regain that greatest of earthly blessings when once lost. I presume in this convention, almost all shades of opinion are represented, but I doubt not that you are all aiming for the one goal, truth. I know of no profession that has made such rapid strides in the past fifty years, and I might say twenty-five years, as the profession of medicine.

Vital statistics show that the average of human life is lengthening, and this I conceive to be due to our better knowledge of the laws of health, and the physicians' better knowledge of how to combat disease. It seems sometimes a little paradoxical that you doctors should want the people healthy, thereby making your business less lucrative; but such *is* the fact, and this fact proves most conclusively that physicians are not a selfish set, and I believe there is not a more self-sacrificing profession on earth than the profession of medicine, or the doctors; and I mean by doctors, those who by reason of study and hard work have made themselves qualified for their noble profession. It is a noble profession, and has many master builders on its records, Harvey, Richardson, Maudsley, Carpenter, Paget, and Bell from over the water, and on our own side, Parker, Alonzo Clark, Bigelow, Atlee, Kedzie, Hitchcock, Palmer, Brodie, and a host of others.

We cannot all of us be masters. But in the language of Locke, "It may be to some of us ambition enough to be employed as an under-laborer in clearing the ground a little and removing some of the rubbish that lies in the way to knowledge."

We laymen can teach the people temperance, cleanliness, and habits of industry, a pathy as old as creation and as true as sacred writ, a pathy which, if followed, would lessen disease and death, and cheat the doctors out of many a fat fee.

I did intend to give the quacks a rap. I will leave that to you. I will say this, however, that I consider highwaymen, horse-thieves, and the like ilk, gentlemen beside them.

Again I say, welcome to our city. May your stay be pleasant and profitable, both to yourselves and to our citizens, and may our meeting together be one long to be remembered by us all.

Prof. R. C. Kedzie, M. D., of Lansing, President of the State Board of Health, then stated the purpose for holding the convention, as follows:

INTRODUCTORY ADDRESS.

BY PROF. R. C. KEDZIE.

The project of holding sanitary conventions in different parts of the State was discussed for some time by the State Board of Health before we reached a final decision. Last winter two such conventions were held in this State, and to-day we meet to hold the third of this series.

Perhaps you ask why you should be called to turn aside from your ordinary vocations to attend such a meeting. The question is eminently proper, and demands a candid answer. The right to life is the first of all human rights. The right to health stands second only to the right to life. Now we find conditions existing and forces at work by which both of these primary rights are needlessly threatened or even destroyed without adequate cause. Upon this needless waste of life and unnecessary impairment of health we make solemn declaration of unrelenting war. We assert without fear of successful contradiction, that a large part of the sickness in this State is unnecessary, and a startling proportion of the deaths is preventable; that preventable sickness is a crime against society, and preventable death is a sin against God.

Some of these causes of avoidable sickness and death are within the control of the individual and can be prevented or removed by his personal efforts; others require the combined action of the community for their suppression and the unaided efforts of an individual are almost futile. It is to the consideration of the latter class of causes of sickness and death that we wish to direct your attention, and invite you to meet and discuss these questions that lay hold on the issues of life. These are subjects worthy of your most serious thought and candid consideration at all times. But it is to the causes that destroy human life in its infancy that I wish to direct your special attention at this time. It is still the opprobrium of our civilization that nearly one half of the human family die under five years of age.

> The air is full of farewells to the dying,
>   And wailings for the dead;
> The heart of Rachel for her children crying,
>   Will not be comforted.

When we look around to see what bloody Herod has filled our State with Rachels weeping for their children because they are not, we are shocked to find it is no omnipotent destroyer before whose relentless sword we must bow in dumb submission, but paltry, sneaking assassins that the town constable ought to arrest and lodge in jail without the formula of a justice's warrant or commitment. Yet we wring our hands in fatalistic submission and fear when we ought to fight.

Who are these Herodian destroyers of prattling infancy? I name only four—measles, whooping-cough, scarlet fever, and diphtheria—yet they every year cut down hundreds upon hundreds of the children of our State. From 1870 to 1874 scarlet fever alone is reported to our State department to have killed 3,122 persons in Michigan, and probably one-half as many more were cut off by the same disease that were never reported at all. If we had the statistics of mortality in this State for the last five years, we should undoubtedly find that diphtheria had killed twice as many as her scarlet sister did in 1870–74.

When the yellow fever struck the gulf States and a wave of desolation swept up the valley of the Mississippi, the heart of the people was moved as the forest is stirred by the breath of the storm.

Yet these four diseases of childhood kill more persons year by year than does yellow fever at the height of its power, and we pass this by as something unworthy of special attention. Here, there, everywhere are the stricken ones folding the clothes and putting away the toys of those who once were so precious and whose memory is still so dear; but the sorrow is solitary, the mourners are isolated, and the people do not arouse themselves and as one man demand the abatement of this slaughter of the innocents. The most of us look upon this frightful waste of life simply as something dreadful—to be bemoaned, but to be patiently submitted to—and not as a dreadful slaughter that must be stayed at all hazards or fenced in like a destroying prairie fire.

But I hear some one object, "These are the diseases of childhood and are to be expected anyway, and there is no use in attempting to guard children from their distinctive diseases." If these are the diseases of childhood, in heaven's name why not throw especial protection around children at this critical period—carry them by this time of danger and in adult life permit them to safely defy these diseases, or with the vigor and strength of adult life withstand their assaults?

With respect to measles and whooping-cough most people are satisfied that they are communicable from person to person, and that if they would protect their children from these diseases they must keep them away from children having these diseases. This is all well enough except that they put the cart before the horse: isolate the sick and the convalescent until danger of communication is past, and let the well go free. In the case of scarlet fever we are beginning to recognize that it is a communicable disease and to act accordingly, only we do not sufficiently recognize the persistence of this poison. But in the case of diphtheria the public have not awakened to the fact that it is a disease which may be imparted from one to another in many ways. The very means used to stay the disease may be the means of spreading it like a forest fire. The newspapers inform us of the fearful spread of this disease in Russia—2,000 dying in one province, and large villages without a child under five years of age. But another paragraph gives the explanation: A consecrated wafer is placed in the mouth of a child having diphtheria and then transferred to the mouth of a well child to prevent his taking the disease, and thus it spreads from mouth to mouth till not a child is left to receive the fatal morsel.

Fortunately superstition has no such hold on the American mind, and yet our practice is not much better. If some darling dies of this disease a public funeral is held in the house reeking with diphtheritic poison; all the children of the neighborhood gather to see the last rites of their play-mate; the coffin is opened that they may see the darling once more—perhaps to kiss its cold lips—and thus the poison spreads, and the darling ones are stricken down by the score till the whole village is clothed in mourning.

Do you say this picture is a figment of the imagination? Would God it were! but let me call your attention to something which is said to have occurred in a village in your county this very winter. A report appeared in a Detroit paper that diphtheria was prevailing to an alarming extent in a certain village in Genesee county. A counter statement was sent to the paper, signed by the leading merchants of the village, stating that no cases of diphtheria had occurred in that village. A representative of the paper quietly visited the place and found that within a short time past 46 persons in that village had died of diphtheria and membranous croup, and the cemetery fairly blossomed with little graves! In the list of the dead were children of some of the very merchants who had signed the statement that no cases of diphtheria had occurred in their village!

> "Can such things be
> And o'ercome us like a summer cloud
> Without our special wonder?"

Shall we dicker and bargain and get gain over these little graves, and deny that death has entered our dwellings lest our trade shall be injured and we lose a few shillings of profit?

I know nothing about the organization of that village, but I venture the statement that there is no organized and active board of health, or an efficient health officer in that village.

How shall we stop the slaughter of the innocents? How shall we throttle these bloodhounds of disease and compel them to relinquish their prey? One way is to create a public sentiment that will force people to take measures of prevention and restriction in case of all communicable diseases; to close these public funerals, which become magazines of infection. If necessary get our legislature to enact a law forbidding a public funeral of any person who has died from an infectious disease, with heavy fines as a penalty for disobedience, such as New York has recently enacted. It is time to meet and talk over these matters and discuss them in all their relations till we come to an intelligent comprehension of our relations to preventable diseases, and understand our duties to our fellow citizens. We may owe the well something more than to let them alone at all times, and we do owe the sick something more than to send for the doctor when they are sick, and to attend the funeral in a helpless way when they are dead.

The newspapers tell us that the New York police had great trouble in keeping the tramps and thieves out of Union Square until they introduced the electric light; these birds of ill-omen fled before its rays. Pour in the light on these sanitary problems, and these diseases will retire to deeper shades and cease to be the great destroyers of infancy. Some one has spoken of "the fierce light of publicity that beats upon a throne," but it is twilight shade compared with the light which the American press throws upon any subject worthy of its notice and to which its attention has been directed. By these sanitary conventions we hope to do two things for the advancement of the public health: 1. To call public attention to existing evils. 2. To enlist the State press in discussing these sanitary questions and in demanding the employment of every safeguard which can be thrown around defenceless childhood. In such ways we may promote the public health, which is the governing thought of your State Board of Health.

Hon. Geo. H. Durand, of Flint was then introduced as the permanent president of the convention, and made the following opening address:

OPENING ADDRESS.

BY HON. GEORGE H. DURAND, OF FLINT, PRESIDENT OF THE CONVENTION.

Ladies and Gentlemen of the Sanitary Convention:—Sir Wm. Blackstone, in his discussion of the absolute and relative rights of persons, asserts the doctrine that when a man emerges from solitude and enters society, he is compelled to surrender some of his natural rights and give up a part of his natural liberty; that as a price for such a surrender, and in consideration thereof, society owes to him certain duties, among which is the careful and rigid enforcement of those rights of personal security which will insure him the legal and uninterrupted enjoyment of his life, his limbs, his body, and his health. Also that no man shall be forejudged of life or limb contrary to the great charter and the law of the land, nor put to death without being brought to answer by due process of law; and that the preservation of his health by its protection from such practices and influences as may injure it is a right to which every man is entitled, since without it the perfect enjoyment of any other right or advantage is impossible.

In consequence of this obligation on the part of society and governments to protect and preserve the health of the people composing them, the question of how to maintain the highest health list, and how to reduce the sick and death-rate to the lowest possible point, presents itself for consideration,—a subject which should arrest the attention and evoke the best thought of the statesman and political economist, as well as of the professional physicist and sanitarian.

Without a reasonable degree of good health, life is a burden. A sick man can see but little beauty in anything. He sees no poetry in the green fields or the bending woods. The beautiful sunlight shines upon him as through a glass, darkly; even the exquisite fragrance of the flowers nauseates him, and he turns away impatient and exhausted from the prattle and tenderness of his own children.

In addition to this personal phase of disease, which does not so directly affect the public, comes the other side of the case in which the public are interested, and *directly* interested. During a man's illness his business affairs are apt to suffer injury and to languish, thereby disarranging other commercial, agricultural, mechanical, or mercantile businesses connected with or dependent upon it. To the extent of such injury the public are interested. The world has a right to demand that every man shall expend a certain and necessary amount of physical and mental force in the work and thought which enrich, civilize, and elevate mankind by bringing wealth, prosperity, and happiness; but this, in sickness, is withdrawn from its rightful channel, and expended in sustaining a diseased body, which may infect others until a whole community shall fall under its spell. By this means towns have become habitations of woe, and great cities have been decimated and almost adandoned.

Plagues and pestilences have been the dread and horror of all nations of the earth from all time. How to avoid them and obtain the fullest measure of robust health, should command the deepest thought and the most disinterested and careful study; for as sorrow and inconvenience and suffering come to a family when a single member lies stricken with disease, so communities and towns and cities suffer inconvenience and sorrow when whole families are brought low. If any reliance can be placed upon ordinary human judgment and experience, or if the testimony of learned and able physicians is worthy of belief, those diseases which are called contagious or infectious, or which, by attacking large numbers of people at the same time are called epidemic, may be largely reduced and easily controlled, if not quite obliterated, by a proper observance of such rules as shall insure cleanliness of body, cleanliness of surroundings, pure, wholesome food, pure clean water, and pure fresh air. Easy as it may seem to observe these apparently simple conditions, and willing as it would seem that most people would be to observe them, yet how to obtain such a general observance by all classes of people, and especially in cities and villages and thickly settled localities, as to be effectual in attaining the end sought, is a question that has puzzled the ablest scientists and the kindliest humanitarians of the age. Many persons do not understand the necessity of cleanliness of person and surroundings, of wholesome food, pure water and fresh air except so far as these contribute to their personal comfort and personal attractiveness. The sanitary aspect of the question is lost sight of, and so sensitive are most people about any suggestion of lack of cleanliness in any particular, that it requires about as much courage to approach them on the subject as to face the deadly cannon's mouth. There are men who will stand and see their own cow driven off to the pound, because found running at large contrary to law, and yet preserve the serenest expression of countenance; who will prevaricate to their wives upon being questioned as to their whereabouts during the evening, when coming in late from "the lodge," and never move a muscle; who will sleep the sweet, happy sleep of boyhood during the most varied and emphatic Caudle lecture, and seem to enjoy it. Yet these same men will become wild with rage, and beside themselves with anger when mildly requested to clean up the vaults and cess-pools and sewer-pipes about their premises.

There are women who can redeem from incarceration a pet flock of geese caught roosting on the sidewalk, and look like the sweetest of martyrs while paying the price of their ransom; who can listen to remarks derogatory to their personal appearance, and yet look pleasant and beautiful as the flowers of spring; who can overhear their children designated as ugly little frights, and yet remain placid as a summer sea; who can sit quietly and feel the treacherous back-hair drop from their shapely heads in the presence of the public congregation, and yet look so demure and innocent and unagitated that all the men present will consider it an entirely pretty and proper thing for the hair to do; yet these same women will become congealed frigidities—statuesque in their haughty indignation and Amazonian in their mighty wrath, when advised to deodorize their houses, and scatter slops and garbage less promiscuously about than has been their habit.

For these reasons, many public officials, whose duty it is (or should be) to preserve the health of the citizen, stand behind this sentimentalism—this fear of giving offence, appalled, subdued, and silenced, while in front of them, and before their very eyes and under their very noses are the filthy vaults, the dirty sewers, the impure water and the miasmatic stenches which fill the air with poison and the community with disease and death.

The main object of such a convention as this, is to talk plainly upon these questions in so far as they relate to the public; to impart such information in regard to sanitary matters as the average public can understand, so that those who are tractable, and willing to submit to proper sanitary rules and regulations, shall not be prevented from doing so by lack of knowledge; and last, but not least, to insist upon such police regulations in reference to the public health, as shall compel those who are unwilling or careless, to submit to these rules and regulations, and thereby do their share toward contributing to the public health and comfort. By this means the willing are encouraged, and the unwilling are forced to observe such rules as experience has demonstrated to be necessary in the prevention of diseases.

The object to be attained by discussing sanitary questions before the general public, is to spread a knowledge of the prevention, rather than the cure, of certain diseases. It is infinitely easier to prevent a disease (where prevention is possible) than to cure that disease when once contracted. The first can, in many cases, be accomplished by the observance of rules, few, simple, and easily followed; while the latter is usually performed only through the services of a professional physician, after more or less waste of time, money and strength, and after more or less suffering of pain and inconvenience. It is an old but true saying that "an ounce of prevention is worth a pound of cure." If more people would recognize and act upon its truthfulness, a great deal of trouble could be saved in this life of uncertainties.

If men would consult those who are skilled in the law before entering into important contracts, the legal scope and extent of which they do not fully understand, many bitter and expensive lawsuits could be avoided. If persons who are so unfortunate as to have property to leave after death to others, would consider the uncertainty of life and make their wills while in the enjoyment of physical and mental soundness, instead of waiting until weakened in body and brain by disease, many disgraceful wrangles over the validity of wills would be averted,—and to die would not prove so destructive to a rich man's earthly reputation as the many scandalous legal controversies over such subjects would indicate.

And so with the health. It is easier to preserve this by preventing disease, than to restore it by curing the malady after it is contracted. It is better to pay a physician and pay him well for information and advice regarding the avoidance of sickness, than to neglect the physician and his knowledge until attacked by disease and *then* pay him for effecting a cure. In China, it is said, physicians are hired to keep their patients well. While the contract is faithfully carried out and health remains unbroken, the physician's pay goes on; but when sickness comes the pay stops and is not resumed until the health of the patient is restored. As a result of this method, it is said that in China a doctor can act naturally and have as good a time as the rest of the world, without forcing mirthfulness when none is in his soul. In China a doctor is really happiest when his patients are all well, and genuinely saddest when all are sick. In China, doctors have no reason to lament a season of general healthfulness, nor to smile and feel happy over a general visitation of measles or small-pox. In China, a healthy, robust man has no fear that his abundance of good health will sadden and discourage his physician, and therefore well, but tender-hearted men do not pass by on the other side to avoid meeting him. In China, lovely woman need not wait for sickness, and hollow eyes and pale cheeks, before calling in her medical adviser, lest the aforesaid adviser look disappointed and sorrowful at sight of her bloom and vigor. On the contrary, she can go into his august presence with the brightest of eyes, the rosiest of cheeks, and the greatest abundance of rich, red blood coursing through her veins, and say "Doctor, see how well I am! Here is your last quarter's salary;" while the doctor is not compelled to force a fever-and-ague smile to his lips to aid his polite congratulations. He can really and truly rejoice with her, and can, in the most heartfelt manner repeat to her Rip Van Winkle's constantly recurring toast—"Here's to your good health, and your family's good health! May you all live long and prosper." If I were of the medical profession, I think I should locate in China, where they make it so pleasant for a doctor.

To be serious, however, while that method of employing a physician seems ludicrous and full of humor to those whose custom is exactly opposite, why is there not much sound philosophy in this theory of our Mongolian brethren? People employ lawyers, sometimes, to guard against possible troublesome contingencies in business; they hire ministers to show them how to keep from some possible, if not probable trouble which they have good reason to suspect may confront them at a remoter period of existence; and why not hire doctors as well, to keep them from possible disease, and to instruct them in such methods as shall preserve health and life?

It is undoubtedly true that lack of knowledge on the part of the public in reference to sanitary subjects,—to the danger of breathing air charged with infectious matter, drinking impure water and using unwholesome food, has been the cause of more disease and death than can well be computed. If, through the operations of conventions of this kind, and through the advice of skilled sanitarians this knowledge can be forced upon the people, the very best results may be confidently anticipated. I was greatly interested, not long since, in an article written by a gentleman who had been engaged in superintending sanitary measures in one department of the British government, and as his statement of facts is plain, and his deductions from them logical—at least to an unprofessional—I feel that it will not be out of place to quote briefly from the article. In reply to the question, What has sanitation done? the writer, among other things, says: "During the last thirty or forty years, that is, since the organization of the sanitary department of the privy council, the rate of mortality throughout England has sensibly decreased, and the average of life has increased beyond all anticipation. Even in old London, saturated as its soil must be with the filth of ages, the judicious employment of sanitary measures, has enabled its inhabitants to attain to a very respectable degree of healthfulness, and to escape in a very marked manner from the deadly effects of organic poisons which are constantly being generated in their midst. I shall refer to just two or three circumstances which have occurred in my own official experience. Some twenty years ago a terrible epidemic of cholera swept across the northwestern provinces of India and nearly decimated the population. Scarcely had the scourge ceased to afflict the land when an outbreak of typhoid fever began to thin out the remnant. Lord Lawrence, who was then the Governor-general, called in the aid of scientific experts, not with the object of mitigating the ravages of the prevailing disease, but to find out what had occasioned it, and to try, if possible, to prevent its recurrence. The writer of this letter, who had the honor of being appointed to superintend sanitary measures in the Punjaub, traced both these epidemics to polluted water. The sources from which the drinking-water was drawn were contaminated with human excreta.

"The city of Zullunder, situated between the rivers Sutlej and Buas, was selected for my headquarters. The epidemic raged here with great vigor, both in the European military cantonments, and among the native population in the civil station—the death-rate having been estimated at something above seventy in a thousand. Within a year after the introduction of sanitary measures the mortality fell to sixteen.

"In 1865, a very loathsome disease, which was epidemic in the city of Delhi, had broken out in the beginning of the year with exceptional severity. The government desired that this question should be looked into without the least delay. A commission was accordingly appointed, consisting of three members, to investigate the cause of the disease, and to report to the Governor-general. The senior member, who was also the president of the committee, was the head of the medical department. He was a great surgeon and celebrated for his skill and dexterity as an operator. The second man was an inspector-general of hospitals, who has since been deservedly raised to the honor of knighthood and to the position of honorary physician to the queen, on account of his eminent abilities as a physician. The third member was, of course, the sanitary commissioner, who was at the time only an assistant surgeon in army rank. The two distinguished seniors of the service talked a good deal of the 'Waves of the disease,' speculated on the possible introduction into Delhi of the Aleppo boil by emigrants or visitors from Asia Minor, and drew out a lengthy and learned report, full of plausible and ingenious theories. The sanitary officer, however, went straight to the water-supplies of the city. He analyzed the water of every well in the place, together with that of the river and the canal. The water of one well, next the Jumma Musjid, one of the most ancient of Mohammedan temples in Hindostan, was found to contain upwards of twelve grains of decomposed organic matter to the gallon. It happened, too, that this well was situated in the very center of the district in which the disease prevailed. In his report, the sanitary commissioner had no hesitation in mentioning this as the source and origin of the loathsome disease, and in suggesting the closing of the well as the only measure necessary to stamp it out. The Mohammedans objected to any interference with their well, which they regarded with almost superstitious veneration, for it had been sunk at the time of Akbar the Great, when the mosque itself was built, and the feelings of race and religion were strongly associated with both these structures. Lord Lawrence, however, being a man of ample resources, thought of a plan which would at once conciliate the good will of the bigots and test the soundness of scientific conclusions. An order was issued to the effect that all the wells in the Mohammedan quarter of the city would be cleaned out at the public expense, and the writer received his instructions in the following curt demi-official: 'Have bottom of well dug up to about fifteen feet. Examine the mud and see whence comes the filth. Then analyze fresh water from spring, and report if fit for use.' All this was quite unnecessary, for after the well was drained and the bottom dug up to about six or seven feet, an *immense mass of human bones* was found imbedded in the black mud and looking as black as the mud itself.

After this discovery there was no difficulty in persuading the Mohammedans to close up the well. In the course of the year the famous Delhi sore, in spite of the 'waves of disease,' and in spite of the visitors from Asia Minor, vanished from Delhi, and has never since reappeared.

"Just one more instance of recent occurrence will suffice. I think it will not only show the usefulness of sanitation, but also the necessity of organizing a sanitary police. Two years ago there was a sudden outbreak of about twenty cases of diphtheria in a clean, respectable street in the northwestern district of London. These twenty cases occurred in about fifteen houses, hardly three of which were adjoining one another, while some of the infected houses were separated from the others by a considerable distance. It was evident that here neither the main drainage nor the main water-supply were at fault. Every infected house was then visited and the drainage and water-supply of each carefully examined, but there was nothing wrong discoverable; yet it was clear enough that there was some one cause which had been operating simultaneously in these fifteen houses. At last it was found that only these fifteen houses along the whole of this street received their milk-supply from the same dairy. Further inquiry led to the information that there were three houses in another street which also had their milk from the same source, and that in those houses, also, diphtheria had broken out. This circumstance was surely something more than a mere coincidence. The inspecting officer next visited the dairy, which was about fifteen miles out of town. On entering the milk-room he saw a small coffin resting on two chairs on one side of the room, and a number of milk-cans arranged on the other. A child had died two days before from diphtheria, and during the whole period of its illness it had been nursed in the very room in which it was laid out. The drainage and water-supply of the dairy premises were then carefully examined, but the inspecting officer could detect nothing objectionable. The problem now to be solved was: How came this boy to take the disease? About a month before his death the boy had been on a visit to his grandmother, who lived some five miles further off, and whose house was in a most shocking state of filthiness. The drainage was defective and the drinking-water very impure. Shortly after the boy's arrival, the grandmother's servant-girl took to her bed, and as soon as her case was pronounced diphtheria the boy was sent back home, but he sickened after two or three days, took the disease, and died. The exhalations from his breath, the emanations from his skin, and his visceral emanations must have tainted the milk directly, or indirectly through the water in which the boy was washed and which must subsequently have been used for diluting the milk for the London market. The mystery attending this outbreak was then cleared up, although some thirty per cent of the sufferers died prematurely from an absolutely preventable disease.

"It will now be evident to the would-be skeptic that it is not impossible to detect the origin of infectious disease, nor is it always very difficult to check its spread; but it is by no means easy to handle the disease when it is once developed into a virulent epidemic. It is always easier to prevent disease than it is to cure it, and sanitary physiology is the only rational means of knowing how to do this."

If the facts quoted are true, and the deductions logical, they furnish food for most serious reflection on the part of people who live in the smaller cities and villages, where the water-supply is obtained from wells. We need not go out of Michigan, nor, in fact, out of this city, to find people, and whole families of them who are using water every day from wells which are filled by infiltrations through soil impregnated with human and animal excreta, and by drains from vegetable and animal filth. Who can tell the amount of disease that has been caused by this practice throughout this State, or what punishment may be inflicted upon the communities which permit it without even informing those who are guilty of the danger to which they are subjecting themselves and their neighbors.

There should be some effective way to get information upon these important subjects to all classes of people. Not only to those who read, and are entertained by scientific dissertation, but to those who do not. Then, after the information is generally diffused, some effectual methods should be employed by those in authority to obtain the best and most perfect sanitary conditions; for, as I quoted at the beginning, the government is under obligation to preserve the health of the citizen from injury and annoyance, so that he can properly enjoy the benefits of civilized society.

If science has demonstrated that swamps and stagnant waters are sources of malaria, then the people should be generally so informed, and such as lie in the vicinity of large populations should be properly drained where possible. If science has demonstrated that the use of impure water will produce dangerous diseases, then the authorities should see that experts analyze the water-supply in thickly-settled localities, and if found to contain poisonous substances, should see that means are employed at once to purify it, or to prohibit its use.

If science has demonstrated that emanations from cess-pools and vaults and sewers are filling the air with infections, the most vigorous measures should be adopted to improve their condition.

If science has demonstrated and experience verified that certain diseases are contagious, the strictest observance of rules to prevent their spread should be insisted upon.

If science has demonstrated that lack of cleanliness and bad ventilation are destructive of health, the victims of these ills should be compelled to listen to innumerable sermons from the text, "Cleanliness is next to Godliness." They should be invited to wash and be clean, and to come out from their ill-ventilated apartments, and woo the roses back to their cheeks in God's pure air.

It has seemed to me that much valuable information upon this subject might be given to the people in a very inexpensive way. We find cities and villages placarded from time to time, with due and seasonable warnings of the dire calamities which shall befall the inhabitants thereof, if they permit their cows to ramble around the streets at too late an hour in the evening; or, if they permit their poodle-dogs to wink at the passer-by, unless muzzled as the law provides; or, if they do, or refrain from doing a dozen other things of similar import. But upon this important subject of sanitation, except in the most general and uninstructive manner, the silence is profound. Why might not small pamphlets or handbills be distributed among the people from time to time, through the regular boards of health, giving information on the subject, that they might know how to attain the best sanitary conditions? I believe that much good could be effected in that way, and that a perceptible increase of good health would result.

In conclusion, I desire to express my high appreciation of the results which have already come from the labor and scientific research of some of the distinguished gentlemen who are present at this convention, and to express the hope that they will continue in their good work, until Michigan shall be blessed with as perfect a system of sanitation as it is possible for human ingenuity to devise.

The following committees were appointed to examine the various sanitary appliances on exhibition and make reports upon their merits:

Ventilation.—Henry B. Baker, M. D., of Lansing, and John S. Caulkins, M. D., of Thornville.

Disinfectants.—Prof. R. C. Kedzie, M. D., of Lansing, and John H. Kellogg, M. D., of Battle Creek

Sanitary Publications.—Rt. Rev. Geo. D. Gillespie, of Grand Rapids, and Rev. D. C. Jacokes, D. D., of Pontiac.

Resolutions.—A. A. Thompson, M. D., and T. R. Buckham, M, D., of Flint.

Sewer Traps, Etc.—Daniel Clark, M. D., and H. C. Fairbank, M. D., of Flint.

The first paper on the program was on "Domestic Sanitation" by John H. Kellogg, M. D., of Battle Creek, member of the State Board of Health, and is as follows:—

DOMESTIC SANITATION.

BY J. H. KELLOGG, M. D., OF BATTLE CREEK.

Mr. President, Ladies and Gentlemen:—I have chosen as the subject of my paper, "Domestic Sanitation," for the reason that I think this department of sanitary science, although by far the most important of all, is apt to receive far less attention than it deserves. State and municipal sanitary bodies are very prone to feel that when they have secured proper drainage, a pure and abundant water-supply, suitable regulations for the abatement of nuisances and the restriction of the spread of contagious diseases, their chief duty is done. Without deprecating the importance of the departments of sanitary work mentioned, which affect communities as a whole, we would invite attention to the fact that there are influences which affect the life and health of human beings as individuals much more seriously than those mentioned, which exist within their own homes, at their own hearthstones, in their own individual habits of life. Public sanitation is essential to the maintenance of general conditions conducive to health and the limitation of epidemics; but domestic sanitation and individual hygiene come much more closely to the root of the evils which lie at the foundation of race-deterioration. It seems to us to be a question well worthy serious consideration, whether we are not allowing ourselves to be deceived in supposing that the vitality and longevity of the race are being greatly increased by the modern attention to public health. It has been claimed, and the claim is sustained by statistics, that the average length of life is to-day several years greater than it was a century ago. Nevertheless, this does not conclusively prove that the constitutional vigor or vitality of the race is proportionately, or even at all increased. Before attention was given to public health, plagues and other epidemics of a very fatal character were very frequent. Often, large portions of the total population of whole countries were swept away by diseases which hardly exist at the present day. This, of course, occasioned a very high death-rate, and reduced the average length of life to a very low figure, notwithstanding the fact that cases of notable instances of great longevity were much more numerous than at the present day.

At the present time the average length of life is considerably greater, but it is a noticeable fact that instances of remarkable longevity are growing yearly more and more rare. Something more than a century ago the great physiologist, Haller, collected more than fifty cases of longevity ranging from one hundred and twenty to one hundred and sixty-nine years; but there have been few if any additions to the list since his time. The effect of improved public hygiene has been to preserve the weak and feeble who were formerly the first victims of the terrible scourges which frequently visited every part of the habitable globe, thus reversing the process which according to Mr. Darwin results in the improvement of species and races through the "survival of the fittest," by keeping alive the *un*-fittest.

Thus while the *average* length of life is for the present increased, it is evident that the ultimate effect must be to diminish the stamina and vigor of the race. Indeed, statistics seem to show that this result is already noticeable. Some years ago Mr. W. R. Gray asserted in an article in the Statistical Journal that the rate of mortality has increased in England since 1820 ten per cent, and probably twelve and one-half per cent. Mr. S. Shattuck, in a paper on the Vital Statistics of Boston, remarks: "The average value of life is greater now than during the last century, but not as great as it was twenty years ago. It was at its maximum from 1811–1820, and since that time has somewhat decreased." If these statements are reliable, and we know of no reason to question them, the deteriorating influence of heredity acting through diseased and degenerated individuals is already beginning to counteract the beneficent results of public sanitation, which may almost be said to have been created within the present century. The undesirable results certain to come from the transmission of constitutional weaknesses was so well recognized among many nations of antiquity, as among barbarous tribes of the present day, that it was a common custom to destroy feeble infants and infirm adults. Among civilized nations the frequent occurrence of plagues and extensive epidemics has answered the same purpose, and the prevention of these cyclones of disease has resulted not only in keeping alive the weak and feeble, but through heredity and intermarriage in deteriorating the strong.

Notwithstanding this fact, which we think will be admitted, we by no means condemn public sanitation. The weak and feeble have as good a right to live as the strong. True Christian charity demands that this class should receive special attention, notwithstanding the ill effects upon the general welfare of the race which may result. But what we wish especially to call attention to is the fact that the evil pointed out may be wholly remedied by proper attention to domestic sanitation and individual hygiene. Public sanitation alone, preserves the weak and feeble, and thus must ultimately result in race-deterioration; but when supplemented by domestic hygiene, the weak and feeble are not only kept alive but are made strong and vigorous thus securing real improvement of the race.

Public hygiene will do much to conserve the health of towns and cities, by preventing the development of causes of disease which arise in consequence of the congregating together of great numbers of people; but it does not so effectually remove the still more active causes of disease which exist in the domiciles of the several families which make up the population of a town or city. Defective drainage, bad sewerage, water and air contamination from organic decomposition, soil-saturation, and other insanitary influences, are well recognized as among the active exciting causes of fevers and epidemic diseases of various types; but there are other influences, still more potent, because more constantly and universally acting, which constitute the predisposing causes of these and other diseases. Every physician is familiar with the fact that whatever deteriorates the vital forces of an individual increases his liability to disease. Whatever clogs the emunctories and so increases the accumulation of effete matters, the poisonous products of tissue metamorphosis, to the same degree increases the individual's liability to suffer when exposed to any specific cause of disease. How often have we all seen illustrations of this fact. The apparently strong and vigorous individual will fall an easy prey to the material causes of such diseases as typhoid fever, yellow fever, small-pox, etc., while one apparently far less vigorous will escape. An examination into the habits of the two individuals usually shows that in the first case they have been such as to impede the elimination of waste products and occasion the clogging of the vital machinery by the accumulation of effete matter, while in the second case, they have been such as to encourage free elimination of the wastes of the system, and place no obstacle in the way of the vital activities of the body. There seems to be no room to doubt that in numerous instances the reception of fever-germs into the system, with the violent febrile excitement which follows, is exactly like the application of an electric spark to a charge of gunpowder in a mass of combustibles. The system is already filled with noxious elements. The blood is gross with retained excretions, and the emunctories are but sluggishly performing their duties. Only a spark is needed to kindle an inflammation which all the art and science of medicine are too often powerless to quench.

The people need to be taught that what they eat, drink, and breathe has an important relation to their health and happiness. Pure air, pure water, and pure food are the three great desiderata of human existence in its highest state. First of all is *purity of air*. Everybody knows that death results sooner from deprivation of air than from the loss of any other element which the system requires. Most poisonous substances, at least such as may be volatilized, will manifest their deadly properties sooner when received into the system through the lungs than in any other way. The reason for this is quite apparent. In the lungs the blood is spread out in a fine capillary net-work, over a surface of about 1,400 square feet, according to the estimates of some anatomists, being separated from the air within the pulmonary cavities only by a membrane of the finest degree of thinness. Through this membrane the gases taken into the lungs find their way with the greatest readiness; and beneath this delicate film the whole volume of the blood passes every few minutes. Thus the blood is literally bathed in the gaseous contents of the lungs. If these are foul and poisonous how quickly must the vital fluid become contaminated. Yet, notwithstanding this fact, so patent and simple, the grossest neglect of air-cleanliness everywhere prevails. People who are the most fastidious about the food they eat and the water they drink, who would as soon think of starvation as of eating what had once before been in a human stomach, will sit with utmost complacency for hours in a public assembly or in a private parlor, inhaling over and over again the vile products of respiration sent out from other human lungs as well as their own, to say nothing about the emanations from dyspeptic stomachs, the foul odors from decaying teeth, the vile exhalations from retained catarrhal excretions in diseased nasal cavities, and the poisonous fumes of nicotiana tabacum.

Filth is no less foul because invisible, and is certainly more dangerous from its invisibility. Disease-germs are always abundant in the rooms of an unventilated house, emanating from a thousand sources. But by far the most dangerous foe to health in unventilated apartments is the organic poison with which the air is contaminated by respiration. Experiments have shown that mice and other small animals will die in a few minutes when confined in air heavily charged with this poison. The moisture which condenses on the inside of the windows of an occupied room in a cold day contains the poison in solution. If a little is collected in a vial and set away, it will soon become intensely fetid and offensive; and when examined with the microscope it is found to be alive with vegetable growths and various low animal forms. This poison also condenses on the walls and furniture of close unventilated rooms, and a characteristic effluvia emanates from them which often clings to the clothing and bodies of the inmates, occasioning what may be denominated a family odor. This poison undergoes decomposition very rapidly, becoming foul and offensive in a few minutes. It is this which gives an unventilated room the close, fusty odor with which every one is familiar. One who has been long in such a room will not observe it; but it is very distinct to a person coming in directly from the pure air outside.

The amount of matter which is thus condensed upon and absorbed by plastered walls is much greater than is ordinarily supposed. Two causes operate to concentrate these fatally poisonous substances in the porous plaster-walls of the living-rooms of dwelling-houses: first, the condensation of the moisture of the breath and perspiration upon the walls, which are usually cooler than the atmosphere of the room; second, the change of air which takes place through all porous walls, the inside air passing out while the outside air is passing in. By these two processes such a large quantity of organic filth is deposited that in the course of time the walls of the room may become highly charged with it. It is said that the ingenious Chinaman has discovered this fact, and that he finds it profitable to remove all the plaster from his dwelling once in ten or fifteen years, replacing it with new, for the purpose of using the old plaster to fertilize his overburdened fields. It is certainly well worth while to inquire whether it would not be wise for sanitarians to advocate the general adoption of this Chinese custom.

A well-ventilated house is so rare as to be almost a curiosity. Our churches, public halls, places of popular amusement, and even the lecture-rooms of our institutions of learning are veritable nurseries of disease. When we reflect for a moment that every breath renders unfit to breathe again three cubic feet of air, and then make an estimate of the length of time required for an audience of 1,000 people to contaminate all the air in a church or lecture-hall of ordinary size, and then consider what must be the intensity of the grossness of such an atmosphere after being subjected to continued contamination for one or two hours longer; when we add to the consideration the fact, now well recognized, that one of the most prolific causes of consumption is the breathing of air which by previous breathing has become charged with organic poison, can we wonder that pulmonary tuberculosis, that dreadful scourge, yearly sweeps away so many of the most promising and talented of our friends and fellow-citizens? Is it not, rather, marvelous that the mortality from this cause is not still greater, although it now reaches the fearful totality of 60,000 victims annually in the United States alone.

But it is not only in public assemblies that this first requirement of nature is violated. At least ninety-nine families out of every one hundred are subjected to the very same conditions at home. Our dwelling-houses not only have no adequate means for regulating the air-supply for the benefit of the inmates, but are so thoroughly built, so well constructed, architecturally, that there is no accidental provision for the constant supply of the great necessary of life. In the less elegant edifices of olden time, fortunately, their very imperfections in construction, their loose joints and airy attics, gave ample opportunity for the ingress of an adequate supply of life-giving oxygen; and the robust frames, ruddy cheeks, and long lives of their inmates, bore testimony to the advantages of thorough ventilation. Our modern dwellings are veritable hot-houses, in which are reared sickly human plantlets, which wither and wilt before the faintest breath of disease. The man who will discover a simple, cheap, efficient, and automatic means for removing foul and supplying fresh air, which can be introduced with small expense into all ordinary dwellings, and can secure its general adoption, will be a benefactor of the race.

In most of our houses, living and sleeping rooms are too small. The British government provides in its jails 648 cubic feet of air-space for each prisoner. The majority of dwelling-houses do not provide more than one-third or one-half this amount of space for each inmate, in its sitting-rooms, parlors, or sleeping-apartments. The air in an unventilated bed-room of ordinary size becomes unfit for further respiration within twenty minutes after it is occupied.

Respiration is by no means the only way in which the air of our houses becomes dangerously contaminated. Many mothers, who wonder "why some of the children are sick all the time," can find the cause underneath the floor. Nearly all houses have cellars. Here are stored all sorts of things for winter use—dead things and live things, articles to eat, and fuel to burn, old boxes and barrels, heaps of coal, bins of vegetables, etc. The coal and wood are continually sending up foul gases. Many of the vegetables undergo decay, and add greatly to the formation of disease-producing elements. Besides the cellar, there is usually an open space under the other portions of the house, between the foundation walls. This space is large enough to admit chickens, dogs, cats, rats, even pigs and other small animals, but not sufficiently large to allow room for cleaning it. Here various small animals find a hiding-place, and often die. Being out of sight and reach, they are not discovered even when the stench of their decaying bodies become distinctly manifest.

All the foul gases engendered in these various ways pass upward into the house, filling every room, condensing in fetid moisture upon the walls, and poisoning all the inmates. Cellars under a house are rather prejudicial to health, even at best. As they are commonly used, they are very greatly so. If there must be cellars beneath the house, they should be large, light, and well ventilated. Every week, at least, the cellar windows should be opened wide to allow free change of air, even in cold weather. A good way to ventilate a cellar is to extend from it a pipe to the kitchen chimney. The draft in the chimney will carry away the gases which would otherwise find their way into the rooms above. Cellars should be kept clear of decaying vegetables, wood, wet coal, and mold. The walls should be frequently whitewashed, or washed with a strong solution of copperas. The importance of these simple measures cannot well be over-estimated. Houses should be built so high above the ground that the space beneath can be easily cleaned every few months.

Many people, who do not appreciate the importance of sunshine as they should, allow mold and mildew to accumulate upon their walls in damp weather, especially in nooks and corners that will be unobserved, never thinking that any harm will come from so doing. Such are ignorant of the fact that each patch of mold is a forest of millions of little plants which are constantly throwing off into the air myriads of germs to be inhaled by the occupants of the house. There is good evidence for believing that the forms of leprosy described in the Jewish law as affecting houses were nothing less than certain varieties of mold or fungoid growths which are especially liable to occur in warm countries like the land of Palestine. The description of this "leprosy in the house," together with the proper means to be adopted to remove the difficulty, may be found in Lev. 14:36–48, as follows: "Then the priest shall command that they empty the house, before the priest go into it to see the plague, that all that is in the house be not made unclean; and afterward the priest shall go in to see the house; and he shall look on the plague, and behold, if the plague be in the walls of the house with hollow streaks, greenish or reddish, which in sight are lower than the wall, then the priest shall go out of the house to the door of the house, and shut up the house seven days; and the priest shall come again the seventh day, and shall look; and, behold, if the plague be spread in the walls of the house then the priest shall command that they take away the stones in which the plague is, and they shall cast them into an unclean place without the city; and he shall cause the house to be scraped within round about, and they shall pour out the dust that they scrape off without the city into an unclean place; and they shall take other stones and put them in the place of those stones; and he shall take other mortar and shall plaster the house.

"And if the plague come again, and break out in the house, after that he hath taken away the stones, and after he hath scraped the house, and after it is plastered, then the priest shall come and look, and, behold, if the plague be spread in the house, it is a fretting leprosy in the house; it is unclean. And he shall break down the house, the stones of it, and the timbers thereof, and all the mortar of the house; and he shall carry them forth out of the city into an unclean place. Moreover, he that goeth into the house all the while that it is shut up shall be unclean until the even. And he that lieth in the house shall wash his clothes; and he that eateth in the house shall wash his clothes. And if the priest shall come in and look upon it, and, behold, the plague has not spread in the house, after the house was plastered, then the priest shall pronounce the house clean, because the plague is healed."

Many have puzzled themselves much respecting the nature of the leprosy thus described, but when we consider the matter in the light of modern sanitary science, the meaning is plain. The description answers exactly to certain species of mold which are apt to form on damp walls, being sometimes greenish and sometimes reddish in color. The mold itself is not communicable to human beings, but as it grows it throws off into the air myriads of germs which gives rise to fermentation and putrefaction, and when taken into the human system, to serious disease. The directions given for removing the evil are most excellent. If scraping off the mold and the plaster of the house and replastering did not exterminate it, the house ought to be torn down, for the recurrence of the mold would indicate that the conditions connected with the location of the house were such as to render it unfit to live in.

How many leprous houses may be found nowadays! The green spots on the wall, the musty odor, and the damp, germ-laden air to be found in many a palatial residence as well as in the spare bedroom and dark parlors of the less pretentious cottages of people of more limited means, are symptoms of house leprosy which, three thousand years ago, would have consigned the infected dwellings to demolition. Are we thirty centuries behind Moses in our knowledge of, and obedience to, sanitary law?

The close proximity of barn-yards, hen-coops, and hog-pens to human dwellings is a frequent cause of serious and fatal disease. The germs which are developed in the filth abounding in those places, together with the noxious gases constantly arising from the decomposing excreta are productive of disease when received into the system. Often, indeed, the well from which the family supply of water is obtained will be located only a few feet from a reeking barn-yard, or, as we have more than once seen, the well will, for convenience, be located within the barn-yard itself. In consequence of the proximity, the water of the well will be contaminated by the soluble filth which percolates down through the porous earth.

Notwithstanding all these dangers, there are people who, incredible as it may seem, still hold to the absurd idea generated in the dark ages, when the streets of every city were one immense reeking cesspool, that foul smells originating in the filthy excreta of horses and cows possess some healing properties. Not long ago, when we appealed to a man to clear his barn-yard, which had become a positive nuisance, being not more than half a dozen feet from the threshold of a dwelling-house, he retorted that he had always been informed, and as he thought by good authority, that a barn-yard smell was the "healthiest kind of a smell," and was "especially good for consumptives." If there is such an absurd error prevalent, it ought certainly to be corrected. No foul, noxious odor can be of any possible advantage to health. Barn-yards should be located at least forty or fifty rods away from the dwelling, and farther if possible.

Drains, sewers, and cesspools, connected with a house are often sources of serious disease. The kitchen sink is not infrequently the door through which disease-germs silently creep into a household and develop into disease and death, the cause of which remains a mystery and is attributed to the inscrutable dealings of Providence.

In the summer, draughts are produced in the room, which suck up the filthy gases which are formed in the cesspool, through the drain-pipe—unless it is furnished with an efficient water-trap, which is not usually the case. In the winter, the gases of the cesspool are naturally warmer than the air above, and so they rise and find their way into the house, filling it with invisible poison, which is breathed, and thus taken into the blood, by every occupant of the dwelling. Thousands of valuable lives are annually sacrificed in this way.

The use of feather-beds may be shown to be detrimental to health in several ways; but we wish to call attention to the fact that they may be a source of contamination of the air immediately surrounding a person during sleep. Feathers not only themselves undergo a slow decomposition, evolving foul and poisonous gases, but on account of their remarkable hygroscopic properties, in which they are equaled by few other substances, they absorb the fetid exhalations from the body which are thrown off from the skin during sleep. As this continues often for a long time, the accumulation may become very great and the feather-bed be converted into a hot-bed of disease-germs. As feathers suffer little loss by use, the feather-bed often becomes an heirloom and is passed down from one generation to another. The older it becomes, the worse it is. It is somewhat alarming to reflect upon the amount of disease-germs which may be stowed away in a sack of feathers which has done service during a hundred years or more. Subject to all the accidents and emergencies of domestic life, it has, perhaps, carried half a dozen persons through typhoid fever, and pillowed the last months of the gradual dissolution of a consumptive, beside being in constant use the balance of the time. We have on several occasions been so unfortunate as to be obliged to sleep upon feather-beds from which odors arose so intense and disgusting as to be almost unendurable. More than once we have, as a last resort, been obliged to pull our bed in pieces and remove the offensive portion of it before being able to go to sleep. Hair, cotton, straw, and husk mattresses are greatly superior to feathers from a hygienic stand-point. By means of a recent invention, felt mattresses are now made which are luxurious enough for anyone and entirely wholesome.

The custom more common in European countries than in this, of allowing soiled clothes to accumulate in closets, or other places, for several weeks, often becomes a serious injury to health. This is especially the case in the summer season when under-clothing frequently becomes saturated with perspiration. The odor arising from soiled under-clothing is essentially the same as that which comes from the organic matter escaping from the lungs, and the material which gives rise to it is almost equally poisonous in character. If clothing cannot be washed within a week or two after it is worn, it should be thoroughly exposed to the sun and air for at least twenty-four hours, by which means it will usually become sufficiently disinfected to obviate all danger from keeping it a longer time.

Many cases of poisoning, some fatal, have been traced to the use of wall-papers the colors of which contained arsenic. Window-curtains, paper boxes, and even articles of clothing have become sources of poisoning from this cause. The color of wall-paper which most frequently contains arsenic, is green, although many other colors have been found to be contaminated in the same manner, as shown by Prof. R. C. Kedzie in his admirable paper entitled, "Shadows from the Walls of Death." It is almost impossible to find a green enameled paper which does not contain arsenic. The arsenical poison is dispersed through the air in the form of fine dust which is separated from the paper by the rubbing of garments, swinging of picture-frames, and in various other ways. Green window-curtains containing arsenic are particularly dangerous, as the frequent rolling and unrolling of the curtain communicates a large quantity of the poison to the air. It is believed also that the poison of wall-paper may be communicated to the air through the fermentation of the material used in attaching the paper to the wall, which decomposes the arsenical compound in the paint producing sulphuretted hydrogen, one of the most deadly of all gases. This is especially likely to occur where new paper is put on without removing the old, a practice which cannot be too severely condemned. We have seen walls upon which there were four to eight layers of this arsenical wall-paper. In one case in which a wall already bore five layers another was being added. Green wrapping paper, even that used in wrapping candies, has also been found to contain arsenic. It may be said that in general, it is wise to avoid green colors altogether. Although all are not in a high degree poisonous, all are likely to be contaminated and may safely be avoided.

Next to pure air, pure and wholesome food and drink are most essential to health. Yet it is almost impossible to obtain a pure article of any variety of food which can possibly be made the subject of adulteration. Several chemists of eminence have testified to facts which show that a large share of the sugars sold at the present time are adulterated with glucose or corn sugar, a chemical compound produced by boiling corn or any starchy substance with dilute sulphuric acid. Honey and syrups are also largely adulterated. Baking powders are rarely free from some injurious ingredient. Butter is extensively made from lard and tallow. In fact, adulteration is the general order of the day in food substances.

But even adulteration, alarmingly extensive as it is, by no means presents so serious dangers, as those to which we are exposed through the use of the flesh of diseased animals. Trichinosis in hogs is rapidly on the increase. The occurrence of tape-worm from the use of raw beef is more and more frequent. Large numbers of animals are killed when just breathing their last from some fatal malady, and when consumed as food must certainly be productive of disease. Prof. Gamgee, of London, asserts that fully one-fifth of all the flesh sold in that city is diseased, to which fact the eminent Dr. Letheby attributes the remarkable increase of deaths from boils, carbuncles, and phlegmon, the last named disease having increased to thirty-two times its former frequency since the introduction of wide-spreading diseases among the cattle of Ireland, which furnish the principal meat-supply of England.

That animals are subject to conditions familiarly known among human beings as biliousness, jaundice, etc., is made evident by indisputable facts. In examination of the carcasses of animals in the markets, very frequently one will be found in which the flesh has a golden tinge or distinct yellow hue. This is known to be the result of some derangement of the liver, and it is a condition which is by no means uncommon.

In certain portions of Europe a regular business is made of producing diseased livers, geese being selected as the victims. This business is chiefly carried on in Strasbourg, which has become world-famous for its goose-liver pies, known as *paté de foie gras*. The geese are shut up in a dark room, their feet nailed down to a plank, and often their eyes are put out, so that they can not exercise too much, and then they are regularly stuffed with corn and dough once in two hours, the food being crowded down the throat of the poor fowl with a stick. Antimony, a mineral poison closely allied to arsenic, is also fed to them for the purpose of increasing the diseased condition of the liver, by which means it is hoped to make it more tempting to French, English, and American gourmands. It requires about thirty quarts of corn to complete the stuffing process, by the end of which the poor geese are so nearly dead that it is certainly an act of mercy to kill them, their diseased livers having become so enlarged as to occupy almost the entire abdominal cavity. It would seem, however, much more appropriate that such creatures should be carried away by the public scavenger instead of being eaten as a delicacy by human beings.

It is a common custom with farmers as soon as an animal shows symptoms of decline in health to send it to the butcher at once, or kill it and sell the meat themselves. When an epidemic among cattle is prevalent, the markets in the large cities are flooded with the flesh of diseased animals. Thousands or animals are consumed every year as food, whose death was only a very little hastened by the butcher. There can be no doubt that a very large proportion of all the animal food sold in the markets is more or less contaminated by disease. Domestic animals suffer with diseases essentially the same as those from which man suffers; and there is good evidence for believing that in not a small number of instances the disease is communicated from animals to man.

A trustworthy butcher informed us that not one in a hundred of the livers of hogs is found in a healthy condition. Often they are the seat of foul abscesses. The investigations and experiments of Dr. A. N. Bell, of New York City, as well as of eminent French experimenters, show that consumption is a very common disease among cattle, and that it is communicable from them to human beings. The president of the Board of Health of one of our large eastern cities, and a professor of agriculture in one of the leading colleges of the country, stated in our hearing that consumption is a great deal more common among cows than is generally known, and especially among blooded stock, which are generally more closely kept than common breeds.

Very recently a case has been reported in which five hundred persons were stricken down with typhoid fever in consequence of eating the flesh of a calf, which, as was afterwards ascertained, had died of typhoid fever. Every person who ate of the flesh of the calf was sick with the fever, the symptoms of which were characteristic, and quite a number died.

Too much care cannot be exercised in the selection of food, especially animal food, as it is only by the most careful inspection and positive knowledge of the condition of the animal at the time of slaughtering that immunity from danger can be secured.

But we have already exceeded the proposed limits of this paper, and must bring it to a close, although we have not called attention as we should like to have done to the numerous personal habits which affect individual health injuriously, such as errors of diet, as overeating, eating unwholesome articles, the excessive use of stimulating condiments, the abuse of tea and coffee, and kindred errors, together with neglect of proper cleanliness.

We were not a little surprised a few years ago to be informed by a farmer living not forty miles distant from this city, to whom we recommended frequent bathing as a remedy for a chronic ailment dependent upon inactivity of the skin, that a drop of water had not touched his back for forty years. There were various positive indications that the individual was fully as great a stranger to *aqua pura* as his remark implied. Many chronic ailments are largely dependent upon neglect of frequent bathing.

We must also mention the almost inestimable amount of injury done by the use of various stimulants and narcotics, prominent among which are alcohol and opium, although in our opinion, tobacco is responsible for almost if not quite as much material damage to the physical vigor of the race as either. We might also dwell at length, if space would permit, upon the injury resulting from many of the customs of fashionable society, particularly night-dancing and various accompanying and kindred excesses.

There is as great a need of missionaries to teach the gospel of health in our cities, towns, and villages, as to carry the gospel of Christianity to heathen lands. This may seem to be a very heretical statement, but we thoroughly believe that the platform of genuine religion and true holiness rests in part, at least, upon obedience to the code of health as well as to those precepts usually distinguished as moral.

No great progress will be made in the physical improvement of the race until the common people become intelligent on the subject; and it is one of the objects of this convention to contribute to that much to-be-desired end.

DISCUSSION.

The discussion was opened by the Rev. Mr. Tyndall, of Flint, who made some strong remarks on the advisability of frequent and thorough bathing. He was followed by Prof. Vaughan, of Ann Arbor, who spoke of the sanitation used in selecting proper food for home consumption, giving a series of rules for determining the quality of meats. On motion of the Rev. Dr. Jacokes, Prof Vaughan was requested to furnish the secretary a copy of the rules referred to, for publication as a part of the proceedings of the convention. The discussion was still further carried on by Prof. MacIntyre and Dr. Malcom.

DISCUSSION RELATIVE TO FUNERALS OF PERSONS DEAD FROM CONTAGIOUS DISEASES.

At this time the Rev. C. J. Thompson called up that part of the introductory address of Prof. Kedzie relating to public funerals of those dead from contagious diseases. The discussion was carried on by Rev. Dr. Jacokes, of Pontiac, I. N. Smith, M. D., of Saginaw, Rev. James Venning, and T. R. Buckham, M. D., of Flint. The general expression of the remarks of these gentlemen seemed to be that public funerals should not be permitted, and that the clergy in the peculiar position they bear to the families of diseased persons could do, and ought to do much to prevent the spreading of contagious diseases by the manner in which funerals are conducted.

A communication from Prof. Thomas MacIntyre, principal of the Institute for the Deaf and

Dumb, inviting the members of the convention to visit that institution on the following day at one o'clock, was read and accepted with thanks.

The next paper was one by Daniel Clark, M. D., of Flint, on "Sewerage and its Adjuncts," and is as follows:—

SOME THOUGHTS ON SEWERAGE AND ITS ADJUNCTS.

BY DANIEL CLARK, M. D., OF FLINT.

Drainage and sewerage, though sometimes practically united, are more often improperly confounded, being really distinct. While drainage has for its object the removal of superfluous water, sewerage is one of the methods which have been devised to get rid of those offensive materials which we term filth. What is filth, and why is it so essential, sanitarily, to dispose of it? For our present purpose, we may define filth to be organic matter in a state of decay. Considered in its essential elements, it does not differ from other organic matter. Chemical analysis shows the same elements, differing only in arrangement. All organic substances are essentially made up of a few of the three score and ten simple elements recognized as constituting the fabric of this planet on which we dwell. Under the influence of vital action we find the selected materials brought into peculiar arrangements, which we term organisms. These are divided into two great kingdoms—the vegetable, which ranges from the simple cell or microscopic mold, or mildew, to the most elaborate plant or tree with its flowers and fruit; and the animal kingdom, which includes all living creatures, from the smallest animalcule to man himself. The animal tissues are built directly or indirectly from vegetable materials. Directly, when vegetable force alone is used, and indirectly, when the flesh or secreted products of animals are eaten. Hence, the higher organisms, animals, are dependent on the lower, as they appropriate to their own use materials which have been raised one step from the inorganic by vegetable life. But it is the lower forms of each kingdom, occupying debatable ground between the two, in which we are especially interested at this time. We would note particularly the facility and avidity with which these minute organisms, whether vegetable or animal, seize upon atoms of decomposing substances to build up their own structures; hence, that repeated marvel, which we witness every season, of the countless myriads of these lower forms which find a luxuriant field for their prolific growth in every mass of decaying matter. Indeed, their office appears to be to relieve the disastrous effect of decomposition in some measure by reorganizing their effete remains; and such, perhaps, would be the general result were the conditions favorable, but unfortunately, these are too often adverse or perturbed and favor a disastrous result.

We may illustrate the subject by reference to fermentation, which is a simple process of vegetation. The fitting material being provided, the access of the germ of the yeast plant, or other ferment, suffices to induce a rapid and marvelous growth; nor is it essential that all the materials be at first fitted for the use of the developing plant, as they appear to possess a power in their vitality of bringing other materials which come within their influence, into a condition best adapted to the exactions of the new formation. This principle may have an important bearing on those diseases which arise from miasma, sewer-gas, etc.; especially since other ferments, including that of putrefaction, follow the same law.

This hasty glance at nature's vital circuit has been made as having a significant, if not very obvious bearing on the subject before us.

The sanitary objection to that organic *débris* which we term filth, physiologically considered, is the facility which it gives for the development of those gases known as sewer-gas, and the like, which exert a most deleterious influence upon the human system—either directly, by their chemical action, or indirectly, by depressing and deranging vital action, and thus favoring the development of those lower organisms which prove to be such prolific and formidable sources of disease.

The important problem before us is, "How shall we get rid of these obnoxious materials?" The simplest answer would be, "By neutralizing them." That is, change their form from the semi-organic to the inorganic as speedily as possible,—hasten the decomposition and bring them into an inert condition, or, else raise them again to new organic forms. The most speedy and effectual way of accomplishing the first is by fire. The efficacy of this agency has been often demonstrated, but never on a grander scale or more effectually than when the plague was exterminated by the great fire of London, whereby a most terrible temporary calamity was converted into a permanent blessing.

A second method of dealing with these death-bearing materials is by the use of chemical agents. This important subject opens up too vast a field for discussion at this time, and I will only suggest a caution that we should be sure that decomposition is really effected, for in too many cases when the attempt is made, only a disguise is effected, which instead of averting only adds to the danger by creating a false security.

A third method is by the dry-earth system, brought into use by the late Rev. H. Moute of England. The influence of earth in neutralizing and utilizing the most obnoxious and offensive materials is well known to every farmer; and its vast importance may force itself upon the attention of the political economist as well as the sanitarian, when the present reckless improvidence shall have rendered sterile the vast grain fields of the west by transporting their phosphates, in the form of grain, to the cities of the old world, thence to be passed through their sewers into the sea and be lost forever. Without stopping to discuss the merits or defects of this system, which has shared the common fate of novelties in a reaction from extravagant claims, it might be suggested that the principle may find a practical application in mitigating some of the appallingly fatal defects of our present sewer-system.

We now come to the fourth and last method, by the use of water. This is the most popular and most ancient method, having been in vogue from the days of the Roman Cloaca Maxima to the stupendous abominations of our modern cities. Water in sufficient abundance is an efficient diluent of sewer material, and, could the accumulated sewage of all the cities in the world be poured into the ocean, it would be lost in its vast abyss, and most completely neutralized. But, unfortunately there are but very few cities which can avail themselves of its advantages. It is true, that other large bodies of water, as lakes and rivers, may be made available substitutes to a certain extent; but, a prosperous city, like Chicago, for example, soon outgrows the sanitary ratio, and while the Chicago River has long been converted into a cess-pool, it now threatens the contamination of Lake Michigan to such an extent as to endanger the city's supply of water from that source, and the attempt to convert the

Illinois and Michigan canal into a sewer has become so great a nuisance as to attract the attention of the State executive, and the project is seriously discussed of soliciting the nation to convert Chicago's sewer into a ship canal of eight times its present capacity, and thus make the metropolitan sewage cosmopolitan by diffusing it through the salubrious water of the Mississippi. Such facts as these, and they are repeated in varying form in most of our large and many of our smaller cities, from Boston to Memphis, call for a thorough revision of the whole subject in the light of those common sense principles which find a practical application in most other departments of American enterprise. When we consider the vast sums of money which are spent in constructing sewers, and the still larger sums which are ultimately squandered in futile attempts to obviate their many fatal imperfections, does not a suspicion arise that the whole system is wrong?

If some of the vast amount which is now spent in ineffectual sewerage was applied for the prompt removal and effectual neutralization, in detail, of those materials which go to form sewage, instead, as at present, of merely transporting them from one place to another, with a concentration of virulence which no precaution can guard against, and no sagacity control, might not better results be expected? But even when these aqueous reservoirs may be efficacious and unobjectionable, another great difficulty is to make them available. The transfer of the sewage to these cleansing waters is attended with so many difficulties as often to render the whole scheme abortive. In the first place, an abundance of flowing water is absolutely requisite, as without it the transfer cannot be made, and the whole project becomes a disastrous failure. And even with an abundant supply of water, the sewer may fail to accomplish its legitimate purpose unless it have a free outlet. If it terminate in a body of water the surface of which is higher than the bed of the sewer, especially if that surface be subject to great fluctuations, as often occur in rivers, no amount of hydrostatic pressure which the sewer can safely bear can be relied upon to empty it, and it then becomes a reservoir of filth, with all the dangerous consequences. If some portion of the sewer be above the water-level while the outlet is below, so much the worse, for the deleterious gases which are distilled from the festering mass of corruption, finding no outlet below, must be forced back into the pipes, imperiling the occupants of all domiciles with which they may be connected. Water-traps are of but little avail and no security, as, even if they resent the pressure of the gases, some of them may be absorbed by the water on the one side and diffused from the other; and, as this diffusion would naturally be greatest on the side where there was the least pressure, ventilation will afford but partial relief. Another query is here suggested. Is there not danger that invisible and impalpable germs, which may be carried up in the escaping gases from the ventilator, may be absorbed by falling rain, and through use of filtered rain-water find access to the human system there to work their deadly mission? If a free discharge of the sewer cannot be obtained by the natural descent of flowing water or by creating an empty basin by constant and efficient pumping, the whole project had better be abandoned at once, or another disastrous failure will most assuredly be added to the thousand and one which have preceded it. And again, the sewer must be secure against leakage, otherwise it becomes a treacherous and dangerous pest, by transmitting its distilled poisons to wells and springs, and thus conveying to the human system germs of fatal disease in a most deadly form. While ventilation should never be relied upon to remedy the defects of an imperfect sewer, all sewers should be properly ventilated, and for this purpose the arrangement exhibited by Mr. Atwood commends itself as all that could be desired in that direction.

To sum up the whole matter, we would say that the sewer should be ample and secure, the flowing water abundant and the outlet free, so that the contents may be transported to a safe deposit speedily, before that dangerous decomposition takes place which generates that most deleterious of city pests, sewer gas. Unless this is done, these depurating purifiers become hot-beds of pestilence, and the conduits and pipes most diabolical arrangements for its distribution throughout the social body; carrying loathsome disease and premature death alike to the palaces of the old world, and the palatial homes of the new; sparing neither Prince Albert in the royal palace of England, his daughter the Princess Alice in the Imperial Halls of Germany, nor the merchant princes of our own land, any more than the common people. Indeed, most public sewers are radical levelers and most efficient communists, funding public filth in a free bank with liberal discounts to all.

In contending against this great social evil, sewage, all the appliances which science can devise should be brought into requisition. Fire, the most prompt and effectual of all, should be resorted to whenever practicable; and, whatever else may be done, in all cases of contagious or infectious diseases, all rags and textile material of every kind which have become infected, and are not of sufficient value to be cleansed by superheated steam and thorough washing should be carefully burned, and never suffered to pass into the sewer.

Chemical agents, under scientific and skillful manipulation, should be made to do efficient service. All solid substances, as the *débris* of the kitchen, decaying vegetables, excrementitious matter and animal remains, should be promptly buried before decomposition has advanced, for the final result which must be obtained, before this ever-threatening evil can be averted, is the reduction of these dangerous materials into an inert or harmless condition.

The purifying property of earth has been already alluded to, and, while the investigations of Miguel show that the germs of bacteria do not pass through overlaying soil from any mass of corruption that may be festering beneath,* other experiments have demonstrated the fact that growing vegetation is the most efficient agent in neutralizing the deadly influence of decomposing matter, and it has been shown in France that sewage may be most liberally applied to sandy soils without any detriment to the neighborhood.

The use of sewers should be confined to what they can effectually accomplish, the speedy conveyance of fluid and soluble materials to places where they can be completely neutralized or rendered inert by ample dilution. Let it be ever borne in mind that sewers are, legitimately, only conductors and not reservoirs, and whenever they are perverted into the latter they become magazines of deadly material, vastly more dangerous than the fire-damp of the miner; for it is a moderate assertion to say that for every life that is destroyed by fire-damp thousands fall victims to sewer-gas.

On motion, Mr. J. B. Atwood was requested to present at the evening session his apparatus showing the defects of the common drain-trap.

The convention adjourned to meet in the evening.

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* [Recent experiments by Pasteur of France, and by Darwin of England, have proved that bacteria do pass through overlaying earth, being carried upward by earth-worms.—H. B. B., Sec. S. B. of H.]

SECOND SESSION, TUESDAY EVENING, JAN. 25, AT 7 P. M.,

Hon. John Moore, of Saginaw, presiding.

Mr. J. B. Atwood, of Flint, exhibited and discussed a method of insuring freedom from sewer-gas in houses by having the air-pipe extend full size to a point higher than the top of the house, having a ventilating pipe from the top of every trap, leading either to the outside air or to the pipe which extends up through the house. He showed by experiments that ammonia and ether, and the ordinary illuminating gas of the hall rapidly passed through the ordinary traps in use, only a few minutes elapsing between the placing of either of these gases on one side of the trap before it was noticable at the other end of the trap. He showed that when such a trap has a ventilating tube from it the gases do not pass with such readiness.

Later in the proceedings of the convention, J. H. Jerome, M. D., of Saginaw, said he had at his house some trouble with a single trap; he added a second and finally a third trap, and he defied any person to detect any sewer-gas in his house. He thought sewer-gas could be kept out of houses by a duplication or multiplication of traps.

Dr. ——, from Canada, spoke on the passage of gases through traps. He thought that gas which will pass through one trap will go through two or more as fast as it accumulates sufficiently. He considered Mr. Atwood's views correct.

The first paper of the evening was on Intemperance as a Cause of Destruction of Human Life, by Mrs. E. Clark, President of the Woman's Christian Temperance Union, of Flint. An abstract of the paper is as follows:—

INTEMPERANCE AS A CAUSE OF DESTRUCTION OF HUMAN LIFE.

ABSTRACT OF A PAPER BY MRS. E. CLARK.

"Human life is composed of at least three essential elements,—the mental, moral, and physical. The improper use of alcohol will impair *all* of these, and it may be used to such an extent that nothing but the semblance of humanity remains.

"This debasing habit of intemperance crops out fearfully through all the pages of history. We find our first parents in trouble from the use of forbidden fruit; Cain, the first murderer—the result of not doing well with the fruits of the ground. Soon after this the first vineyard was planted, and drunkenness is then called by its true name. We find Sampson despoiled of his eyes and strength when disordered with drink; Nebuchadnezzar roaming the fields insane for seven years,—long enough to get the alcohol out of his system,—afterwards reformed and living long enough probably to know that his son, Belshazzar, had inherited his appetite; and he, with all his kingdom, was overthrown in rioting and drunkenness. We learn that 'Priests and prophets had gone astray through wine,' and at last woe was pronounced upon the drunkard and the one that gave the drink."

Mrs. Clark recites many instances of loss of life in recent times, and shows that alcohol still remains directly and indirectly a frequent cause of death. With reference to the views of prominent physicians, Mrs. Clark quotes the following:—

"In view of the alarming prevalence and ill effects of intemperance, with which none are so familiar as the medical profession, which has called forth from English physicians the voice of warning to the people of Great Britain concerning the use of alcoholic beverages:

"We, the undersigned members of the medical profession of New York and vicinity, unite in the declaration that we believe that alcohol should be classed with the most powerful drugs; that when prescribed medicinally it should be with conscientious caution and a sense of grave responsibility.

"We are of the opinion that the use of alcoholic liquor as a beverage is productive of a large amount of physical disease; that it entails diseased appetites upon offspring, and that it is a cause of a large percentage of the crimes and pauperism of our cities and country.

"We would welcome any judicious and effective legislation, State or National, which should seek to confine the traffic in alcohol to the legitimate purpose of medical and other sciences, art, and mechanism."

"There were over one hundred and twenty signatures of prominent physicians to this letter, among them Edward Delafield, M. D., ex-President of the College of Physicians and Surgeons, and Willard Parker, M. D., President of the Academy of Medicine."

Referring to the anxiety because of danger on railroads, etc., from color-blindness among employees, Mrs. Clark suggests that there is a greater danger from "beer-blindness."

"People are coming to this conclusion [that there is great danger from permitting those who use intoxicating liquors to remain in responsible positions] since some of the terrible accidents by stage, railroad, and steamboat; and are expostulating against the employment of men who use intoxicating liquor, in any form, as a beverage. At the annual meeting of the stockholders of the Old Colony Railroad in Massachusetts this resolution was adopted:

"*Whereas,* The stockholders believe many accidents are due to intoxicating liquors, the president, superintendent, and directors are instructed to hereafter employ *no* person who uses intoxicating liquors as a beverage."

The paper closes with an earnest appeal that in connection with sanitary studies and efforts, as much prominence shall be given to this great cause of loss of human life and health as is given to the reclaiming of low, swampy and miasmatic lands, to the improvement of drains, cess-pools, and other evils which impair the public health.

DISCUSSION.

Rev. Mr. Northrop said if we forbid the sale of diseased meat because it is dangerous to the public health, we should also prohibit the sale of alcoholic drinks which are also injurious to the public health. In some statistics he showed the comparative longevity of temperate and of drinking men.

Prof. Vaughan, of the University at Ann Arbor, spoke of the injury caused by alcohol interfering with healthful digestion and assimilation. In reply to the question, "Is alcohol a food," he replied that some authorities so considered it on the ground that whatever is oxydized within the body is a food; but if we hold that nothing is a food that does not add to the sum total of avaliable force, alcohol may not be considered as a food.

The next paper was on the "Relations of Sanitation and Christianity," by Rev. Chas. H. W. Stocking, D. D., of Detroit, and is as follows:

SANITATION AND CHRISTIANITY.

BY REV. CHAS. H. W. STOCKING, D. D., OF DETROIT.

In that great Eastern metropolis which looks down on Massachusetts Bay, and in its public garden, gorgeous with golden and russet and crimson wealth of flower and shrub, I stood on a recent autumn day before a unique monument of granite. On one side is the sculptured figure of a youth from whom a physician has plucked the last sting of pain, and on another side the sculptor's chisel tells you that an anonymous citizen erected that shaft to commemorate the discovery of ether, as an anesthetic, at the Massachusetts General Hospital in 1846. You need not long inquire for the foundations of the donor's philanthropy, for above the recumbent figure of the youth are written the words of the beloved disciple's sweet assurance, "There shall be no more pain." I know of no better illustration with which to emphasize the vital connection of sanitation with Christianity. The granite shaft is a beautiful and pathetic allegory of religion itself, and it marks the progress of the race under conditions which Christianity has largely determined. Turn from that monument whichever way you will and you will come face to face with some memorial erected by piety and philanthropy to such men and things as made for peace and rest. Around and within the famed and historic "Common" is the most restful atmosphere that ever stirred near the great heart of any busy city, and from the midst of it rises another huge monument whose bronzed figures epitomize the history of our late rebellion, reaching up toward the skies in colossal strength to tell how peace is conquered by power. Standing midway between this and old St. Paul's, you might see at a glance, and "graven in the rock," a witness on either hand to both the Apostolic Succession and Sanitary Commission, looking over at each other in benignant serenity, and both mutely eloquent with the Christmas message of "good will to men." As far beyond the gleaming waters of the sylvan Charles as your eye can reach is beautiful Mt. Auburn, thickly sown with the bodies of men eminent in Church, and State, and Letters, such as Bowditch and Story, Choate and Agassiz. They and a hundred others are almost lost among the gathered treasures of the City of the Dead, so modest are the externals of their last and lowly dwellings; but their monuments all tell of a rest gained by some one's labor, of a peace possessed through some one's power, of relief from suffering, and of some scattering of the mists of ignorance by a torch kindled by faith, and fed by humanity. The city of the living and the city of the dead seemed possessed with the same spirit of beneficence.

Perhaps I may, in this way, have laid some real foundation for what my subject has already suggested. I have not supposed that I was honored with this appointment because I was likely to say anything which had not been said, and better said, long ago. But if, on the other hand, I am expected to bring to the great work of sanitary reform the testimony and the sympathy of the pulpit, then I have not misconceived the design of this honorable body, and may hope, in some humble degree, to further their noble work.

The great Founder of Christianity early impressed upon the minds of his hearers the fact that they had bodies as well as souls, and His apostles after him laid down sundry well-defined duties concerning those bodies. Sanitation was, from the first, religion put in practice. The Savior's miracles were, nearly every one, wrought upon some form of mental and physical disability, or suffering, and the confidence of men was won through the arts of the Good Physician. A lunatic, a leper, or a cripple were scarcely in any condition to be taught a creed or to listen to a pious homily. Jesus meets a deaf-mute, but says nothing to him of the Messianic kingdom and ministry until He has unsealed the closed eyes and opened the closed mouth. He stands over the grave of Lazarus, not to make of the fresh mound a pulpit from which to discuss original sin, or to convert the hour of bereavement into an opportunity of rebuke and exhortation, but to weep first like a genuine man, as if for the son of His own mother, and then to restore the brother to sorrowing sisters.

He came not to construct a code, but to live a Life. Philosophers like Plato and Hillel had, doubtless, anticipated something of His wise utterances, but they differed from each other in that while the former *lectured*, He *lived*. What He *was*, and not what He *said*, influenced men, and when he would illustrate the mischiefs of sin, His curse fell upon an unfeeling fig-tree, and not upon one of the sinners who assailed Him with hostile carriage and cruel invective. When He founds a kingdom, it is lodged in men's hearts, and not in a palace girdled with bayonets and sabre, and He sends His ambassadors into every court of the wide world with the commission, "As ye go, heal the sick, cleanse the lepers, raise the dead, cast out devils." Wherever this spirit of practical philanthropy prevailed, the church conquered; wherever it was wanting, the church was compelled to retire disgraced and defeated. Every victory of

Christ and His Apostles over disease and deformity was a restoration of the body to something of its original excellence; and a profound respect and solicitude for the rights of that body has been one of the notes of pure religion in every age. In fact Christianity inherited this much from Judaism.

Infidelity has found no stone of stumbling on which to whet the edge of its sarcasm so keenly as in the Book Leviticus, in whose pages Jehovah is represented as busying Himself with the material of a garment, the cut of a vestment, and the details of a bath. To my mind, it was quite worthy of God Himself to teach the natural affinity of cleanliness and godliness, and that He was to be acceptably worshiped not only with "a pure heart," but also with "clean hands." While it is true that no man by taking thought can add a cubit to his stature, it is equally true that the Jews became the longest-lived people in the world by strict observance of hygienic regulations in the Mosaic law. The eleven kinds of personal impurity for which lustrations were prescribed were so many proofs of the dignity of the human body, and the special reward bestowed by Jehovah on filial duty and honor was that their "days might be long in the land." To all this Christianity added fresh sanctions. Because Jesus Christ had condescended to assume humanity's fleshly vesture, and because holy baptism dedicated the bodies of His disciples as temples for the indwelling of the Holy Ghost, and because, further, the resurrection of those bodies to a more glorious life was the positive promise and assured hope of Christian men and women, sanitation became God's own and approved work. Drunkenness and sloth, violence and lust, gluttony and indecency were sins against His own Image. St. Paul, in his very first Epistle, stands up among the Romans as an advocate retained by Christ Himself to enforce the Divine claims on the human body: "I beseech you, brethren, by the mercies of God, that ye present your bodies a living sacrifice, holy, acceptable unto God, which is your reasonable service." We shall understand the force of this exhortation the better if we remember that Christianity was then confronted with three great schools of philosophy—the Stoics, Epicureans, and the Cynics. The first taught that sickness and health, life and death were matters of entire indifference, and that the extinction of all human and physical sensibilities was the noblest virtue. The second held that the eternal bliss of the gods was complete inactivity, and from so absurd a position it needed but a short path to bring one to indolence, gluttony and disease. The third school professed that they had found the great truth, and the supreme virtue of life, in stern simplicity, and independence of all externals, and it gave the world a set of fanatics who despised decency, cleanliness, civilization, and labor. Before Christianity had gotten more than the thews of an infant, it was strong enough in its moral purpose to rebuke, and with no stammering tongue, the stern stolidity of Zeno, the effeminate sensuality of Epicurus, and the beastly degradation of Diogenes. If its utterance has ever faltered, it has been not from a change in its inner convictions, but through the personal abuses of fanatical disciples, and the influence of pagan philosophies. Some of the earlier Christians conceived the idea that the soul was everything and the body nothing, and while one crucified his members, another rioted in eating and drinking, and a third lay down in the gutter of all impurities. Contempt for all sanitary laws became the scandal of civilization and a mockery of genuine religion. It sent Antony and Pachomius and Symeon, and multitudes of others, to caves and deserts, some to torture, and others to befoul their bodies, and the darkest pages of religious history are those that are written up with frightful records of the unnatural wedlock of Christ and Moloch, religion and degradation. Happily, however, this was true only of certain religious orders and communities. Indeed if Christianity had no other and better enforcement of its claims than its concern for the bodies of men, it would stand by this test alone. Pagan Rome built *hospitalia,* but they were merely guest-houses for travelers. Following the example of its great Founder who "went about doing good," Christianity made sanitation one of the first duties of discipleship. The functions of a deacon were confined chiefly to administering relief to the sick and poor, and womanhood saw no dedication of its tender ministries so worthy and exalted as in a consecrated warfare against disease and suffering under the banner of the Cross. Out of this inherent instinct of religion the hospital was born, and to Christianity alone the world owes that particular form of organized benevolence. The hospital of St. Basil at Cæsarea was one of the marvels of antiquity, and Gregory can find no grander thing to say over the body of the dead Bishop than this: "Go forth a little from the city, and behold the new city, the treasure-house of godliness, in which disease is investigated and sympathy proved. We have no longer to look on the fearful and pitiable sight of men like corpses before death. Basil it was, more than any one, who persuaded those who are men not to scorn men, nor to dishonor Christ, the Head of all, by their inhumanity towards human beings."

When the great plague had filled Carthage with the madness of the whole earth, and the heathen population left their sick untended, and madly flung the bodies of the dead into the public streets, St. Cyprian organized a sanitary commission that soon brought order out of chaos, and anointed ten thousand heathen lips to proclaim its praise. St. Chrysostom was a power whenever he stood up in the great Cathedral of Santa Sophia at Constantinople to preach the Gospel, and the applause, which not even the sanctity of the place could arrest, is said to have been like the roaring of the sea. But when he stripped that magnificent creation of piety and wealth of its marbles and jewels to found hospitals, he evoked the applause of the celestial hierarchy also, and enthroned Christianity in the hearts of humanity. We need not multiply such instances. Religious history is rich in illustrious examples of the confessed relation of Christianity to sanitation, and some of the earlier councils of the church bound its bishops by canon law to the very work and duties that have convened this honorable body of learned men and intelligent citizens.

From the historical aspect of our subject we pass to its practical application. The laws of health are the laws of personal righteousness. If the highest ambition of the Greek were to become an athlete, and give, in war, a splendid body to the State, the Christian is much more bound to present his body a living offering to God, who has, in the person of Jesus Christ, dignified humanity forever by wearing its vesture. If the world is to be converted to the cross by consecrated human lives, the prolongation of those lives is an obvious duty. Active Christianity will, therefore, be both curative and preventive. This fact takes us at a stride to the family, in which are laid the all-enduring foundations of social, political and religious thrift. I do not hesitate to express my conviction that if the church is ever to regenerate the world she must take her stand at the fountain-head of human life, as well as at its tributaries and its mouth. She finds in the revealed word her warrant for the doctrine that marriage is not merely a civil contract, but a divine ordinance, invested with religious sanctions and guarded by ecclesiastical and moral penalties. If she is logical and consistent she is bound to believe and teach that the physical and spiritual welfare of the individual and of society is laid in Christian wedlock. And by this I do not merely mean that she is to furnish a clergyman as the officiant in a decorous marriage-ritual, but that she ought to so instruct and guide the conscience as to promote none but felicitous unions. In republican America marriage is too commonly supposed to be the business of only the two contracting parties, and not at all that of parents on the one hand or posterity on the other. But I do not hesitate to say that such marriages as are likely to generate or perpetuate a feeble, diseased, or vicious stock, are sins against the individual body, the State, and Christianity itself. For the laws of nature are the laws of God also. "Whatsoever a man soweth that shall he also reap," is not more true of the spiritual than it is of the physical economy. You may as soon expect to reach the most marvelous horticultural perfection by emptying a pail of grubs around your choice trees, as to expect a sound and happy posterity to come through a scrofulous or consumptive channel. If the elective affinities of the sexes draw them together so that God "Setteth the solitary in families" through the mysterious power of human affection, it none the less follows that prudence and foresight are commanded and blessed by Him. He is not to be engaged in a perpetual miraculous interference with the laws of heredity—His own laws. Christian parents ought to know, if any one, that they have in their keeping not only their own rights but the rights of the unborn also. I may be traveling outside the record in discussing heredity, but it seems to me to be a vital part of sanitation. If so, it follows as a positive duty of practical religion, that no one should contract marriage for himself, or herself, without intelligent study of the conditions of happiness. Very much of the sickness, poverty, vice, and crime with which a clergyman is brought in contact is easily traceable to violations of those conditions, and if his experience has been a varied and extensive one, he cannot escape the conviction that marriage without mental, moral, and physical adaptation is a crime against natural, social, and divine law. Christian young women are sometimes so much under the spell of moral chivalry—as they think it to be—that they give themselves to dissipated and broken-down men, and sometimes to perfect lepers, with the persistent, yet vainly sentimental, notion that they—the wives—are the ordained reformers of degraded manhood, a notion that they are soon rid of. Others, reasoning that the affections are given of God, and should follow their own suggestions, marry without visible means of support, or before nature is old and strong enough for the perilous honors of maternity, or into families whose blood has been tainted by drunkenness, consumption, or insanity, and when, in after years, they or their offspring moan in pain and heartache through sleepless nights and wretched days, or bewail their unrelieved poverty amid the faded gentility of better times, then they talk about the mysterious dispensations of Divine Providence! When men and women will place themselves under the full law of Christian responsibility they will regard their bodily members as sacred to all cleanliness, moderation in labor, rest and appetite, and through these to intelligent and perfect development for Christ's sake, for humanity's sake. No pride of name or pedigree, no necessities of business, fortune or station, and no mawkish sentiment about human affinities or affections, will then suffer themselves, or their children, to launch upon society a freight of fresh physical woes through improvident or merely sentimental marriages. If God *gives*, religion none the less should *restrain* the affections, and guide them in safe and salutary channels.

Under this head, a word or two about the physical education of our children.

In our homes are the future fathers and mothers of society. If the Christian is, in a peculiar sense, his brother's keeper, and an avowed subject and teacher of the Golden Rule, he is bound to guard and promote their physical well-being. Now and then we are wakened at dead of night by the most thrilling cry that can startle the sleeper, "Child Lost!" Repeatedly within the past year the press and telegraph have told us of whole communities threading the forest, and dredging waters, to recover some stolen or wandering child, and as we have read we have paid generous tribute of tears to sympathetic humanity. But if Elmwood and Woodmere and other cities of the dead could give forth a voice from the little graves that line their silent streets, that there would be terrible revelations of many lost forever through ignorance, carelessness, and criminality who can doubt! In most of our large cities ninety out of one hundred little ones under five years of age are said to die, while in the Oneida Community against whose moral leprosy Christianity has recently taken up its crusade, ninety-five out of one hundred live and thrive! Is polygamy then better sanitation than Christianity! God forbid! But the daughters of Faith, Hope and Charity frequently invade the simplicity of childhood with the food, dress, amusements, frivolities, and unseasonable hours of even middle life, arraying them in fashionable gauze and fine linen, parading them in evening parties, and on platforms of public display, stuffing them with confections, and cramming their little heads with bits of show-learning to the utter destruction of childhood itself.

The nursery and the open air, simple food, unfettered limbs in unembroidered garments, romp and play, sleep sought at the birds' own hour,—these will prevent many children from drifting into the great Ocean of Eternity. Dr. Emmet insists that all the nerve force of the child—especially of the better classes—should be expended upon organic growth, leaving the schooling of the brain to a later period, and compensating for a delayed entrance into "Society" by robust health, exuberant spirits, and "*sana mens in sano corpore.*"

Perhaps we shall be thought to make a precipitate descent if we come down to the daily dead level of our domestic economy, and say something of the Christian's duty in the department of housewifery. Hecquet, a celebrated French physician, when called to visit wealthy patients, was used to say to their cooks, "I owe you my gratitude, for without you and your art of poisoning the Faculty would soon find itself in the workhouse." In accepting the Mosaic account of man's creation, Christianity opposes the evolution theory. But this theory has certainly this much of truth, that there is an intimate relation between mind and matter. If the food which we take into our systems is transmuted into thought, and if evil thoughts prompt to evil deeds, if we do not sometimes chastise our dinners, ought we not to chastise our cooks?

Fully recognizing the glory of an ideal womanhood, and of the equality in all essential respects, of the wife with her lord, and, further, that she is not created to be his "hewer of wood and drawer of water," but his companion, is it not true that she is his divinely-appointed helpmeet? The Bible has some very plain and practical reading on this subject. And in an age when household duties are considered by many as a degradation, and inconsistent with the claims of society and fashion, shall Christianity have nothing to say of dietetics! For once fashion is in league with utility, as it opens its cooking schools, thus confessing that good cookery is among the lost arts in too many households. The relation of nutrition and digestion to our physical and mental moods is too obvious to need discussion, and old John Calvin has found not a few involuntary disciples in whom dyspepsia has generated a keen perception of predestinated perdition. Hygiene has a most intimate relation to religious moods.

Twice of late I have been called to spiritually medicate poor souls who fancied they had committed the sin against the Holy Ghost, but whom two weeks of careful diet, rest, and good medical care released from the horror of that unpardonable sin. Religion is so often made an emotional state rather than a deliberate conviction and an underlying principle, that victims of spleen or rheumatism often fancy themselves outcasts from the divine favor.

If gastronomy be a sin, and a glutton, like the one in Punch, eats and drinks everything, and then goes to bed "leaving them to fight it out among themselves," is it not, at least, a mistake and a misfortune that so many of the poor cannot properly prepare what their hard labor or the hand of charity has brought them? And if waste, and extravagance, and incompetency in every station are sins, do they not come within the domain of Christianity's great reformatory work? In the olden time, the pagan bride was drawn to her husband's home in an open cart, and by the hands of her male friends, and when they had lifted her over the threshold of her new home, they burned the axles of her rude bridal chariot, and scattered the ashes on the door-sill to intimate that henceforth she was to find in her home her highest sphere of usefulness and happiness, and in its employments her noblest art. Would that the ashes of a burnt axle were scattered over every American threshold! Solomon has given us in the thirty-first chapter of his Proverbs a picture of the ideal religious woman, and when all American wives and mothers, sisters and daughters have reached his standard, there will be more intelligent culinary supervision, mutual helpfulness, cheerful economy, and material thrift, and less waste of substance and patience, less anxiety and mortification, less provocations to discontent, disagreement, discouragement, and even profanity, and, by consequence, more serenity, comfort, and Christian love in our households. All honor to those who find in home and family their noblest sphere of action and ambition, and thus become domestic priestesses before an altar which God hath blessed.

Perhaps I have touched sufficiently upon the relation of Christianity to sanitation to justify my subject, and so in conclusion need only add that there is no part of the great field of humanity and philanthropy where religion is not bound to go with her gentle ministries, and that whoever neglects or wars against the human body is her enemy. She has a rod with which to smite every oppressor, whether it be the landlord who makes his unventilated and unsewered tenement-house a death-trap to needy and desperate humanity, or the rumseller who steals the frugal gains of the laborer, and poisons his body and soul with his detestable fire-water; or the ship-master who packs his hold with living freight and tosses to them starvation-fare; or the manufacturer who holds in legalized bondage from early morning till late evening little children who ought to be playing at their mothers' knees; or the adulterator of food and drink whose lying labels cover so many commercial deceits. She condemns him who drugs his senses with alcohol, or stupefies his brain with tobacco, or prostitutes his body to lust, or who shortens the span of life by inordinate pleasure, unnecessary exposure, or needless overwork and mad haste for wealth, and may she soon be fearless enough to lift up her voice from all her pulpits against that great host of murderers who in every rank and station, in the church and out of it, are engaged in a cowardly slaughter of the unborn innocents!

What she is doing in all her great missionary, reformatory, and charitable enterprises and institutions all readers of current religious events well know. In place of the Old Brewery and the Five Points in our great metropolis, with their reeking filth and odious crime, she has substituted clean and virtuous houses, palatial warehouses, schools, and mission homes. In the very streets where a few years since, human life was rated less than the life of some dogs, and where each night was a fresh opportunity for violence, not a few of the queens of American society are going up and down in safety on errands of sanitation, religion, and humanity. Medical missions in China and Japan are the work of Christianity only, and they have, after a few months labor, opened a door at which the preachers of the Gospel have long and vainly been knocking. All around the circle of civilization, faith and works are being united in perpetual wedlock, and "what God hath joined together, let no man put asunder."

A vote of thanks was extended to Rev. Dr. Stocking for his able paper, and the convention adjourned.

THIRD SESSION, WEDNESDAY, JAN. 26, AT 9:30 A. M.

Hon. John Moore, of Saginaw, in the chair.

The secretary read the minutes of the two preceding sessions and presented letters of regret from the following eminent sanitarians and gentlemen: P. H. Bailhache, M. D., Washington; A. N. Bell, M. D., New York; Henry I. Bowditch, M. D., Boston; Hon. M. S. Brewer, M. C., Pontiac; Stanford E. Chaille, M. D., New Orleans; Prof. E. S. Dunster, M. D., Ann Arbor; Hon. John Eaton, Washington; Edward Fenner, New Orleans; A. L. Gihon, M. D. Washington; H. O. Hitchcock, M. D., Kalamazoo; H. A. Johnson, M. D., Chicago; Hon. Hugh Mc Curdy, Corunna; Prof. A. B. Palmer, A. M. M. D., Ann Arbor; John H. Rauch, M. D., Chicago; Hon. J. S. Sinclair, Hamilton, Canada; Prof. E. A. Strong, Grand Rapids; D. W. C. Wade, M. D., Holly.

The first paper of the session was by A. W. Nicholson, M. D., of Otisville, on "Some of the Dangers to Health pertaining to Pioneer Life." It is as follows:—

SOME OF THE DANGERS TO HEALTH PERTAINING TO PIONEER LIFE.

BY A. W. NICHOLSON, M. D., OF OTISVILLE.

Although the field is being repeatedly gone over, the material that goes to make up the subjects belonging to the science of sanitation certainly seems limitless. Concerning this science we can imagine no end to experimental inquiry—no end to the development of new facts and new philosophies, for it deals with the health and happiness of humanity.

The city has its dangers to health, and the sanitarian for years has been directing his attention to the removal of these dangers; to defects in the construction of its dwellings; to its system of sewerage; to the removal of its multiple evils that make sickness and cause death among its inhabitants. Although the city may abound with "contrasts of splendid intentions, and miscarried achievements" in reference to its sanitary regulations, successful indeed have been the labors of the sanitarian for the benefit of its inhabitants.

The rural districts close about your cities have their dangers to health, and for the special weal of its residents, much is written by which they may obtain valuable knowledge that will enable them to improve their sanitary surroundings. In the urban and in the rural districts, the benevolence of some citizen, or some civic regulations, or the wealth of the individual owner usually serves to bring about a practical application of the suggestions science has made.

But there is another class of people who naturally are subjected to *some* dangers to health different from those to which the classes just referred to are subjected, and that are often greater. We refer to the class of pioneers, they, who by the peculiarity of their situation are greatly debarred from profiting by scientific information of vital importance to them. They are, as a class, extremely poor. They enter the wilderness to build a home for themselves and their families, almost in total ignorance of any laws that govern health, or of the methods of scientific farming, and their whole environment is such, at present, that we cannot expect them to be well informed in regard to any such laws or methods. We can picture in our minds a colony of pioneers who, more than two centuries and a half ago, at New Plymouth, laid the corner-stone of prosperity to that State that was the first of this nation to make itself preëminent in the interests of State medicine; their want of proper habitations; their lamentable sicknesses, and losses by death. Not twenty miles from this city are pioneers to-day, subject almost to the same hardships, almost to the same disasters, carving at the initial steps to the prosperity of Michigan. The stroke of the axe in the forest primeval is there, and the ill-constructed habitation, with too little light, and too much ventilation.

To a great extent, many of the unpleasant conditions that surround the life of the pioneer, are not alterable by the measures that the literature of a sanitary science has offered; and the first stroke of the axe is a premonition of dangers that seem sure to appear.

Not often can a Utopia spring into existence in an uncultivated waste, without the painful labors and deprivations of a settler's life, like the city that suddenly lifted itself to view upon the barrens of Hempstead Plains—the Garden City of Long Island, with its pure water, and perfect dwellings, "constructed with an eye to artistic effect," for the benefit of a coming citizen.

If the new settler has *any* knowledge of a system of drainage it is pretty sure to relate to the improvement of the productive qualities of the soil and not to health matters. His house is hurriedly constructed on account of pressing labors in other directions. In selecting his site he is apt to pay little attention to the facilities for sub-soil drainage. He often builds over a natural excavation in the earth that may serve as a receptacle for fresh vegetables in the fall and for decaying vegetable debris in the spring. He, through an absence of the proper knowledge, or a proper appreciation of the importance of the subject, disregards the provision that the floor of the house should be "impermeable to wet and laid so as to exclude ascending moisture and earth exhalations." The ill-constructed *floor* is one of the greatest dangers to which the new settler is commonly subjected. Too often may deaths and prolonged sicknesses be traced to this evil; and it is a common evil among them. The air of the room whenever artificially heated will, to an extent according with the degree of its temperature, become permeated with moisture, and the higher the temperature the greater will be the moisture, providing there exists a free communication to a humid atmosphere outside. If beneath the floor is a damp soil, or a pool of water, there certainly will be a dangerous degree of dampness in the room above. It is an exception to the general rule when sickness does *not* occur when these conditions are present. We have seen all the members of a large family stricken with serious sickness, one of whom died, where the circumstances just described existed. Their sickness was of such a nature as to preclude a theory of contagion in reference to the cause. The cause was more emphatically traced to the rising vapor, or to the poisonous germs transported by it. The majority of the houses are so rudely constructed as to have a constant free communication between the internal and external air, both containing an equal amount of moisture, or nearly so, when the air of the house is *not* artificially heated. When the temperature of the house is *increased* artificially, a circumstance that frequently obtains from necessity, the amount of moisture therein will *exceed* that of the external air, or the air of the room will even be saturated. What is saturated air? For the convenience of estimating the relative amount of moisture the air may contain, air that is saturated is said to hold one hundred per cent of moisture. Air most conducive to comfort or to health will contain about sixty-five or seventy per cent of moisture. This fact can easily be demonstrated by any one possessing a psychrometer, or any other instrument by which an estimate of the humidity of the atmosphere is made; and, such an instrument as this would be of value to any person. It will tell you, as we have stated, how much dampness there is in the air about you, and whether it is present to a dangerous degree. It will point out to you, in the hot days of summer, when to guard against sun-stroke, for hot days with excess of moisture, are the harbingers of that event. It will often tell you when to be merciful to the dumb brute as well as to yourself.

The dangers to health surrounding the home of the pioneer do not bear so strong a relation to its immediate contiguity to forests as to other circumstances. If too little sunshine at times seems to exist in the forest for the sustenance of health, this evil is often more than counterbalanced by its protection of the individual from the effects of the torrid heat of the sun which might be serious to one exposed on open undrained lands. Wherever man may choose to reside, whether at the equator or at the poles, a certain degree of temperature of the body must be maintained. His judgment and ingenuity are exercised to maintain this equable temperature by the invention of proper apparel, and of various other ways to meet the vicissitudes of climate. Too great, or too little radiation of heat from the body will produce a physiological disturbance. The forest shields the pioneer from the fierce winds of winter, preventing a large loss of heat necessary for the body to retain, and, in summer, while beyond the boundaries of the forest the air is still and burning, a gentle breeze within its borders greatly facilitates a healthy radiation of surplus heat from the body.

The dangers from imperfect drainage about the habitation of those who may live among the forest trees are greatly mitigated by the drainage that the roots of the trees themselves perform, absorbing much of the impurities of the soil, with its excess of moisture. Perhaps the residue of impurities, not taken up by the trees, that may arise in the exhalations from the ground may be neutralized, or destroyed, by the abundance of that subtle element ozone, or active oxygen, large quantities of which often exist *in* the forests.

But the time is sure to come when the destruction of the trees, opening the way to agricultural improvements, opens it to dangers not experienced in that locality before. The amount of moisture in the air over an open space fluctuates with its frequently varying temperature, depending greatly on the amount of dampness in the soil. The more porous the soil, as in an open sandy tract, the greater will be the evaporation. These frequent variations in the temperature and humidity of the air are deleterious to health. The amount of moisture in the atmosphere of the forest is subject to far less fluctuation. Its even, low temperature allows much of the moisture to be retained in the soil, a large portion of the excess being taken up by the trees themselves. Wells and springs often dry up because of the removal of a growth of timber that prevented a rapid evaporation from the soil.

Prof. Ebermayer of Aschaffenburg, a few years ago, arrived at the following conclusions from his meteorological observations on forestry: "If from the soil of an open space one hundred parts of water evaporate, then from the soil of the forest, *free* from underwood, *thirty-eight* parts would evaporate, and from a soil *covered* with underwood only *fifteen* parts would evaporate."

One of the greatest dangers to health to which a pioneer is subjected is when he turns over the furrow of the new soil. It is difficult to tell what volumes of poisonous germs are concealed beneath its quiet surface, to be thrown into the air by the point of the plowshare. Also, the increased porosity of the soil, now crumbled and broken, has greatly increased its evaporating surface, unrelieved by any system of drainage, and what are the consequences? There is an excess of aqueous vapor in the air above it. The functions of the skin and lungs are interfered with because the natural exhalations from these organs are prevented. If the air contains as much aqueous vapor as it is able to contain, that is, is saturated, there is a suspension of evaporation from surrounding objects, and man is no exception to this general rule. Sickness would be the consequence were any one exposed to such conditions for any length of time. It has even been doubted whether life can be prolonged in air saturated with moisture, with a temperature of 90° or 100° Fahrenheit. Many times have we known of instances where repeated exposures to conditions bordering on this extreme have resulted in the loss of a year's labor and expectations, because of the sickness that followed.

The pioneer is fortunate if he selects land with soils least calculated to be generators of sickness. Observations teach us that that soil which is most porous, beneath which may lie a sub-soil retaining great quantities of moisture within itself or upon its surface, is the most unsafe. Sandy soil above such a sub-soil therefore would absorb a great amount of moisture from beneath, which would be rapidly evaporated, perhaps loading the atmosphere with other elements of disease than that of dampness. In over one hundred cases of fever coming under our own observation during eight months of the year 1877, most of the cases of which were in families of those recently located upon new lands, about 90 per cent were where they were subjected to the continued influence of emanations from undrained sandy soil.

In Michigan it is not uncommon for a pioneer to select a site in the forest contiguous to low swamp lands; perhaps such swamps are a part and parcel of his own territory. Not comprehending or appreciating the dangers resulting from such an action, he removes the belt of trees interposed between his dwelling and the low marshy tract. The sudden sickness that is apt to follow indicates some new danger. It cannot be doubted that this new danger is caused by the destruction of the trees intervening between the dwelling and the marsh. It may be that the trees serve as a screen, intercepting infectious germs that in the absence of the foliage would penetrate to the atmosphere of the dwelling. Certainly the removal of these vegetable growths would be a removal of a strong factor in the prevention of an excess of atmospheric moisture about the dwelling.

As an illustration of the absorbing qualities exhibited in some trees, the eucalyptus, or gum tree, it is said, will eliminate from a swampy soil eight times its own weight in water in twenty-four hours.

The Popular Science Monthly tells us: "The civic station of Futtehpoor is situated between Allahabad and Cawnpoor, in an arid plain, but near a pretty extensive marsh. This place was considered extremely unhealthy until the magistrate planted between the station and the swamp a belt of quick-growing baboal trees. As the trees grew the place became much less unhealthy." The writer of the article supposes these trees to have acted as a screen, preventing the diffusion of poisonous germs to the inhabited plain.

Another danger to which the pioneer is apt to be subjected is from the absence of pure water as from deep wells or of wholesome spring-water. It is not uncommon for him to depend upon surface water from an excavation in the soil, and sickness from the use of it is a frequent consequence. His attention is wholly directed to the clearing of his lands as of chief importance. He has no time to consider the advantages of drainage or of the construction of a well, or of any proper sanitary surroundings. The pollution of the water he often uses is sensible to the "sight, the taste, and the smell," or perhaps he does not recognize any source of contamination until the "doctor comes."

The character of the drinking-water is a subject that is receiving, and should receive, widespread attention. Although many of the elements of contamination that are discovered in the drinking-water in cultivated districts are not contained in the surface-water of the wild lands, the frequent mixture with the latter of the soil itself, together with much organic material, makes the use of it dangerous. In regard to the use of impure drinking-water, the following incident is related: "Recently a clergyman actually preached to his parishioners that a devastating fever among them was a visitation from God upon them in punishment for their sins, while at the same time a gentleman, writing to the authorities to complain of the water-supply, dipped his pen in and wrote with the water from the river instead of ink." However much we may honor the discernment of the gentleman mentioned, was not the clergyman right in this instance? Is it not a sin to disregard the laws of health instituted by the Divine Creator that are so plainly manifest; and are not devastating sicknesses often plainly retributions in consequence of somebody's disregard of natural laws that are easily discernible? To plead ignorance of the law, is no extenuation for the crime, as viewed in the statutes.

The English commissioners a few years ago classified potable waters as follows: As wholesome—1, spring-water; 2, deep well-water; 3, upland water. As suspicious—1, stored rain-water; 2, surface-water from cultivated lands. As dangerous—1, River-water to which sewage gets access; 2, shallow well-water. The latter is that commonly used by the new settler.

Were a statistician to record the individual cases of sickness actually occurring in these new regions, and compare the number with the number of cases as existing in well-drained and well-cultivated districts, the result of the comparison would, I am sure, be startling; and the loss to the State of the important results of labor by the idleness of its members from avoidable sickness, would supply food for serious reflection to the political economist. In a lumbering and pioneer community with a population estimated at 150, we have known more than one-fourth of the inhabitants to be under the care of physicians at one time.

If our pioneer were an alumnus of our Agricultural College he would be prepared to meet the dangers before him. He would utilize his knowledge in choosing a site for his dwelling in the wilderness. He would take into consideration the topography and the geology of the situation for the sake of drainage. He would see that the soil upon which he would place his habitation was such as to admit of immediate drainage, and that this significant matter was accomplished before a sill was laid toward the construction of it. He would select a point, no doubt, where the water-line was deepest beneath the surface. Perhaps he would place his house upon a southern, in preference to a northern, slope of land, on account of the condensation of moisture being less upon the former than upon the latter, for some of the vapor of the warm south wind from the open country is pretty sure to become condensed when it reaches the cooler atmosphere upon the less sunny side of the northern slope. Who has not experienced the discomforts that exposures to chilly fogs give rise to? It is well known that a certain degree of constant moisture, especially in the soil, is essential to forest growth. In accordance with this fact a northern slope should be the location generally chosen for a range of this growth, on account of the precipitation of the moisture that is condensed by coming in contact with its cool air. In addition to other benefits, trees planted in this situation would act as a shelter from northern winter winds. Also for reasons previously stated, the pioneer should either plant or allow to remain standing a belt of trees intervening between his house and any low, marshy, undrainable parcel of land where the ground-water is subject to frequent rise and fall, saturating the soil with moisture as it rises, and as it descends leaving a large surface from which a speedy evaporation must ensue.

Another source of danger accompanying pioneer life is the usually grave influence of his surroundings upon the course of contagious diseases. The liability to death, or even attack, from these diseases, is certainly greatly lessened by the presence of good sanitary surroundings. It is not a flight of the fancy that enables us to picture a habitation built of logs with wide interstices between each of them, where the dank air from a region of swamp upon which it is situated sweeps through it; and this where six of a family of seven are suffering from diphtheria. It is needless to say that the pale horse visits this dwelling as it does others similarly situated.

But, alas! there is an absence of a consideration of matters relating to the general laws of health on the part of the pioneer because of his pecuniary circumstances never having admitted of his obtaining such a preliminary education as would prepare him for the perils to which he must be subjected; or because he has not had free access to the proper literature that would enlighten him upon these subjects.

If our generous State, through principles of political economy, does not deem it expedient to institute measures for the increased diffusion of sanitary knowledge that will render less the unnecessary loss of life and labor in the ranks of its vanguard of citizens; or, if local boards of health, who are the legal protectors of the public health, cannot recognize the adoption of such measures as related to their guardianship, then there is a field left open for the labors of the philanthropist.

When the pioneer enters into this field of unknown perils, well may he say, like the slaves in the desert who cried unto the Lord to look to them across the shining sands, Lord, look to us across this wilderness!—

"Thro' the furnace of the noon,
Thro' the white light of the moon,
Thou, our morrow's pathway knowing
Thro' this strange world round us growing,
Speak! and tell us where we are going.
We are weak, but thou art strong,
Short our lives, but thine is long;
We are blind, but thou hast eyes,
We are fools, but thou art wise"

DISCUSSION.

I. N. Smith, M. D., health officer of Saginaw, spoke favorably of Dr. Nicholson's paper, and added several points which he thought should be considered in such a connection—namely, the direction from which the prevailing winds come (which was southwest in this State) and the importance of so locating houses and outbuildings that the prevailing winds shall not bring to the house exhalations from swamps, barns, privies, etc. He mentioned the importance of placing privies distant from wells.

In response to a question as to whether water from a well, or filtered cistern water was safest in cities and villages, Prof. Vaughan, stated some facts bearing upon the subject. Lithium was sown upon the surface and afterward found in water at a great distance.

H. P. Seymour, M. D., of Byron, spoke on the subject of contamination of water, giving details of the outbreak of typhoid fever at Lausanne, Switzerland, and making the point that filters were not to be depended upon to take out really dangerous impurities in water.

H. C. Fairbank, M. D., of Flint, gave some facts relative to four cases of typhoid fever connected with the use of spring-water of offensive odor and taste, about sixty feet below a "water closet" (privy?). The persons abandoned the use of the spring, dug a new well, and typhoid fever had not appeared there since.

Rev. Mr. Tyndall, of Flint, spoke of the underground currents of water and the impossibility of learning the real source and quality of water except by testing of every well.

Prof. Kedzie gave details of cases of sickness in two families occupying the same house, and the cessation of sickness when a new source of water-supply was procured.

The next paper on the program was by J. H. Jerome, M. D., of Saginaw City, on "Domestic Sanitation." It is as follows:

DOMESTIC SANITATION.

BY J. H. JEROME, M. D., OF SAGINAW CITY.

Mr. President, Ladies, and Gentlemen:—Domestic sanitation opens a wide field for thought, and discussion, far beyond the limits of a single paper for an occasion like the present. The existence of a State organization, with its auxiliaries in every city, county, and town, within its borders, specifically devoted to the preservation of the health and lives of its citizens in a sanitary sense, is quite suggestive of an existing necessity for the exercise of their several functions.

The importance of a thorough system of police for the preservation of civil order in society—the protection of property—the apprehension and punishment of criminals, is fully recognized wherever our civilization has gone. Has a burglary been committed?—a citizen arrested upon the highway, and his money taken from him for naught? Has a murder been committed, and the perpetrator still at large, and the community where these things occur remain undisturbed? I tell you nay. The community is alarmed. The avenger is on the alert—personal security is in jeopardy, and each man feels that he has a personal interest and duty, not only in the arrest and punishment of this particular offender, but the prevention of kindred repetition, where, perchance, himself may be the victim.

It is a cardinal principle in human affairs that all infractions of social order must be reduceable to personal account, to secure in its defense the individual citizen.

The criminalities to which we have alluded are so glaring and manifest in their character and tendency, as to awaken a deep interest in the mind of the humblest citizen of our commonwealth, and challenge his active coöperation in the detection and punishment of the transgressor.

The importance of a thorough and efficient sanitary police, with full power and authority to act in our stead—to so guard the avenues through which disease and even death may enter—to the educated sanitarian, is quite as important as that a civil police should be established for the detection and punishment of the highwayman or the assassin. To the uneducated mind in sanitary affairs, this may be a startling announcement, and savor of extravagance, and yet nothing is more easy of solution than the truth of this proposition, and in order that the common mind should be better educated in sanitary science, these discussions are being held in town, county, State and nation.

When any part of our national domain is invaded by pestilential disease, as that of cholera or yellow fever, the alarm is given through the press, and the national heart is quickened in benevolent action—subscriptions are astir, and our philanthropy is taxed to its utmost tension. Physicians, nurses, provisions and money are in urgent demand for the alleviation of the sick, the dying, and the burial of the dead. These philanthropies overleap the boundaries of a solid south, or a united north—they come from the east, the west, the north and the south alike, as ministering angels for the alleviation of human suffering.

When these pestilential whirlwinds have subsided, and the ultimate cause of these great calamities is ascertained, it not unfrequently happens that their origin is found to exist in an essential want of domestic sanitation.

Individuals are lax, communities are lax, and the germs of disease are generated, fostered, and developed in the form of some terrible epidemic, before the community are awakened to a sense of individual or public danger. It is this fostering care of incipient disease by individuals and communities which sanitarians seek to obliterate, and in its stead, to awaken a watchful guardianship of individual and public weal.

To this end, enlightenment is needful. It is important that each individual should acquaint himself thoroughly with the pre-requisites of healthful living. It does not depend so much upon the amount of atmosphere which his lungs are capable of receiving at a given time—neither the amount of food which he may eat, or water which he may drink, in order to healthful longevity, but it is the quality of these ingredients of living concerns him most.

The blood which courses our arteries and veins, in its passages through the lungs, where it comes in contact with the atmosphere which we inhale is vitalized, or its opposite, just in proportion to the purity, or impurity of this prime necessity of our being. In a general sense this proposition may be understood, but not in its minutiæ.

The exhalations from the surface of the earth, and their influence upon the health of a community is but slightly appreciated.

It is generally understood that ague and fever prevail in a new country, but the reason why is not so apparent. Comparatively few understand that when virgin soil is turned upward by the plow, and subjected to the rays of the summer's sun, that from its surface malarial exhalations arise—when inhaled, poison the blood, and engender bilious disorders. The same is true of every noxious odor which contaminates the atmosphere—it is not alone offensive to the nostrils, but enters into the circulation and poisons in a most essential manner this vitalizing fluid.

To obviate these sources of danger, a thorough system of drainage should be established, not only in cities and villages, but country as well. When the rains descend and saturate the soil to the depths of the clay subsoil (if that exist) and there is no subterranean outlet established, and the soil is relieved only by evaporation, in granger parlance, it becomes "sour," and the exhalations are "sour," and the crop is "sour" and dwarfed. Therefore, not only the health of a community demands this essential pre-requisite to healthful living, but economic considerations also prompt in the same direction. There is another and paramount reason why a thorough system of drainage, particularly about our dwellings, should prevail. No one questions the importance of pure water. The first inquiry of the emigrant to a new country, as well as he who is about to purchase a home for himself and his family in town or country is, Have they good water there? Poets have sung of the "babbling brook" and the "mountain spring" as objects of human desire. The diseased and enfeebled of our race everywhere, when they set out in pursuit of a health-restoring locality, are not in search of a cess-pool, or anything of kindred character, but the "mountain spring," or some island of the sea, where the atmosphere which they breathe, and the water which they drink, or in which they bathe their bodies, are uncontaminated by exhalations from decaying verdure, or other subtle poison. Do local diseases of a malignant type prevail? Look to your wells and ascertain their relationship to vaults and other receptacles of effete and noxious matter. Consult sanitarians, and ascertain to what distance these poisons may traverse subterranean channels, and find a lodgment in your wells. The results of the inquiry will astonish the incredulous. All malignant disorders—diphtheria, scarlatina, typhus fever, and their kindred,—are the natural offsprings of the depravity of our vital fluids. All parties therefore are prompted to examine this subject with care, and see to it that the deaths of their offspring or others' loved ones are not directly chargeable to their own careless neglect. This subject of pure air and efficient drainage in a State so level as Michigan, is one of paramount importance when compared with the Green Mountain States, with Pennsylvania, or Colorado, surrounded as we are by wide and deep water, insuring always an equable temperature, with ample possibilities for drainage, insuring one of the most desirable and healthy States in this Union, under proper sanitary regulations. There can be no acceptable apology for local or general remissness in the discharge of such an imperative duty.

Taking leave of this branch of our subject, where carelessness and negligence are the prime sources of danger, we enter upon the consideration of another of equal importance, but by far more difficult to compass or control, for the reason that its foundation and superstructure also are founded and reared by the avarice of men. One party, the vender, and the other the purchaser of the commodities upon which we subsist. The vender is intent on making money, and the purchaser equally so in his endeavors to save money. Thus we have cupidity and avarice as the controlling power in all that relates to our living. Cheap living is the demand of the multitude, and to meet this demand and still make money is the great thought of the vender. The chemist's laboratory is brought under contribution, and from it, down through all the different gradations of purveyors to the lowest huckster, is found one conglomerate band of counterfeiters of the wholesome food and condiments of living. The farmer, if you please, goes to the store to purchase groceries for his family. Tea, coffee, spice, pepper, ginger, sugar, and saleratus are in his bill, and the price charged him by the grocer is commendably low. But are they in truth the articles which they are represented to be? I tell you nay, most emphatically, if there is a cheaper article which can be so combined as to resemble the one intended. Indian meal is cheaper than the root of ginger, and a very small amount of cayenne pepper goes far to add smartness to the taste, and yellow ochre or some other coloring matter which does not produce instant death, with small addition of ginger to give the compound its natural flavor, in nine cases out of ten makes up the pound of ginger which is taken home for domestic use. And this is but a sample of the remainder. And yet this fraud is pleasing to the purchaser, for the reason that it costs him less money than the genuine article; and it pleases the vender as well, for the reason that his profits are far greater than can be obtained for the genuine article.

The watering and poisonous adulterations of milk sold in cities and large towns for family use, not unfrequently out-Herods Herod in the destruction of young children; and yet, the perpetrators of this most criminal fraud have only been admonished, perhaps by legislative action, that in the future they *must* sell *good milk*. Some additional frauds of more recent origin upon the fair fame of the gentle bovine are assuming most gigantic proportions, and new articles of commerce are forcing their way to the front,—one under the specious name of "oleomargarine," which for short is called *butter*,—composed chiefly of beef's tallow and hog's lard with coloring matter to give it the genuine appearance of "Orange county butter" *prime*. The imitation is so good as to deceive any but the expert in this line. The color, consistence and general appearance is very much the same, and being sold in the market as butter, it is left for the consumer to determine its character. Bread and milk and bread and butter are the chief ingredients of living with children, and by all conceded to be for them the most wholesome food. We may readily imagine the influences of a change from pure milk and pure butter to a concoction of chalk, water, and some milk, with coloring matter for cream, and "oleomargarine" and even good bread for children's diet. As a matter of luxury as well as substantial food, the value of cheese as another product of milk has been held in very high estimation in all civilized countries, and so much so as to invoke strong competition in all the dairy regions of Europe and America. And so thoroughly has the spirit of emulation of Briton and the continental countries been awakened in the United States, that the best strains of dairy stock have been sought out, and imported to this country at very large cost. The Short-horn, the Devon, the Holstein, and the Jersey are amongst these importations, and hold very high rank as family and dairy stock.

The United States Cheese Association is an institution of great value, and is yearly widening its influence for good in demonstrating to the country the importance of this particular branch of husbandry. As in other instances, the increasing popularity and usefulness of this article of wholesome food, and commercial value, has stimulated the cupidity of unscrupulous men, and by a little stretch of the "oleomargarine" invention, has consolidated that compound into the consistency of cheese, which is finding its way into our markets as the genuine article.

While we are not fully in the secret of the method of making this new-fangled cheese, still we are informed that in order to give to the surface the right complexion, a wash in which corrosive sublimate forms the chief ingredient is used.

Through the instrumentality of the State Board of Health, another development is finding its way to the surface, as illustrative of the extremes to which the cupidity of men will lead them, when no positive restraint is interposed, which in its nauseating and loathsome details, stands, we think, without a parallel to-day. The question of the contagious character of hog cholera, and the possibility of its being communicated to other domestic animals, and by them reproduced and extended indefinitely was under consideration, and for a better understanding of the question, the Secretary, Dr. Baker, was directed to visit the southwestern part of the State, where the disease was known to prevail, and gather such facts as were deduceable from its history in that locality. Coupled with the Doctor's report, was an exhibit of a peculiar state of facts relating to the commerce then going on, between the purchasers and venders of hogs. The people were reticent and non-communicative relative to the existence of the disease, all being anxious to dispose of their stock on hand with as little delay and notoriety as possible.

This anxiety opened to the dealers in this commodity a fair field for speculative operations, and the only requirement on the part of the purchaser (as the Doctor was able to report) was that the hogs should be delivered on the cars alive. The remainder of the story is told at Chicago, or elsewhere—wherever they are taken for slaughter, to be converted forthwith into pork, hams, sausages, and lard.

It was the province of the writer but a few years since to visit the stock-yards and slaughter-houses at Chicago—and their immensity is doubtless known to most of you. The capacity of slaughtering from five to seven hogs per minute, and beef, and other animals in like proportion, affords some idea of its extent and capability in this direction. The contributions to this locality are derived from a very broad extent of country. The cattle, very many of them, come from Mexico, Texas, Colorado, Utah, Kansas, Nebraska and Missouri, the hogs mostly from Illinois and adjacent States. It is the condition of some of the hogs which were slaughtered in our presence, that I desire to present for your consideration.

While I was taking observation of the different yards which contained this great variety of stock, there were being driven along one of the passage-ways some 1,200 or 1,500 hogs, which from their general appearance I supposed to be a newly arrived drove. In order to a better observation, I climbed upon the fence where I could see them distinctly, and amongst the drove, as nearly as I could estimate there were forty or fifty apparently in the last stages of "hog cholera," some of which being unable to go further, laid themselves down to die.

Supposing them to be on their way to an assorting place, where the sick could be separated from the apparently well, I followed them on until all that were able ascended an inclined plain to the upper story of the slaughter-house, to which I immediately gained admittance and climbed to a position directly over the pen from which they were taken by the operatives for slaughter, and ascertained that such as were sick of cholera died as honorable a death as the most healthy, and were consigned to as honorable position with their fellows after death as the best of them.

After having gained this piece of information, I became solicitous to know the fate of such as had fallen by the way in their pilgrimage to this "Mecca" of the hog. They were being gathered up, some already dead, some yet alive, and as I ascertained this class were utilized in the manufacture of lard, out of which is made the "oleomargarine butter" and the "hog cheese" of commerce. I confess since then to have lost my relish for "sugar-cured hams," "lard crackers," pork, and "pickled pigs' feet," that I had any reason to suppose came from any of the great slaughter-pens of the country.

These delineations, ladies and gentlemen, are no idle tales, engendered by my peculiar fancy. They are but a moiety of existing realities which confront the sanitarians of the present day. Their labors, if successful, are of Herculean character. They, therefore, invoke most earnestly the concurrence and coöperation of all parties for the accomplishment of the great work which lies before them. They ask you, and they ask me to contribute our quota to the general work. Should we withhold it? Does not our personal interest demand a more careful and enlightened supervision of our homes and our home affairs? May we not widen our influence, not offensively yet effectively, for the promotion of sanitary interests in the community where we live? May we not move upon our legislative bodies, State and National, for the enactment of wholesome and efficient laws for the protection of the human race, from their infancy to their age, remembering always that the evil to be overcome has its sordid fangs nerved and fastened upon the body politic in avarice and long-continued neglect?

We are therefore assured that no velvet-footed legislation will eradicate the evils of which we complain. The injunctions of law should be mandatory, and the sentinel whose duty it is to enforce obedience should stand at the gate of entrance, and with an inflexible balance divide between the evil and the good.

The next paper was on "The Force Value of Foods," by Prof. Victor C. Vaughan, M. D., Ph. D., of the University of Michigan, at Ann Arbor. It here follows:—

THE FORCE VALUE OF FOODS.

BY PROF. VICTOR C. VAUGHAN, M. D., PH. D., ANN ARBOR.

Foods for animals are substances which, when taken into the body, aid in building up or repairing tissue, or increase the potential energy of the animal. In the growing child much of the food is used in building up tissue. In the person convalescing from some wasting disease, the principal part of the food is consumed in repairing or replacing the worn tissue. But in the healthy adult the chief office of food is to furnish force. Heat necessary to maintain the normal temperature of the body must be generated. Mechanical work, as in the circulation of the blood and in the contraction of the muscles, can be done only by the liberation of force. Foods contain latent force which in the body becomes manifest. Force, which, as light and heat, is furnished by the sun, is taken up by the plant. Indeed we may say that the plant acts as a reservoir for any of this force which may not be needed just at the time by the animal. You know that light is essential to the growth of the plant; that in the sunlight and under this condition only, the plant takes up carbonic acid gas and liberates oxygen; or in other words, it deoxidizes carbon. This deoxidation is simply a process of locking up force, for as soon as oxidation begins, force, as heat and motion, is liberated, and thus becomes manifest. During the summer time the growing fields of grain catch up and retain this force which comes from the sun as heat and light; during the winter, the grain is taken into the bodies of animals and there undergoes the process of oxidation, or this force is liberated and manifests itself in the production of animal heat, and in the movements of the body. We may bear in mind the following facts: 1, Force like matter is indestructible; 2, The sun is one of the great sources of force; 3, This force is rendered latent in the growing plant and may be retained there indefinitely; 4, In the animal, oxidation or liberation of force takes place and is made manifest in the almost constant temperature of the body, its motions, etc.

As we have seen, the bodies of animals need a constant supply of this energy or force, and how is it to be obtained? You cannot place your hand upon just so much abstract force and consign a part to your bones, another to your muscles, and another to your brain. The cook cannot serve force *as such* upon the dish. Abstract force has never been made into cookies, pies, mutton-chops, veal cutlets, nor even into sausage. Since you cannot eat and digest force in the abstract it is necessary that you obtain it in some other way; consequently you take into your bodies certain substances which contain latent force, which, owing to certain changes undergone in the body, becomes manifest force. These substances are food. A food may increase the total amount of liberated force, either by furnishing force as a result of changes within itself, or by causing changes in other substances, or by both of these means; thus, drinking a cup of tea is often followed by an increased exhalation of carbonic acid much greater than could be supplied by the tea itself. In this instance, the tea increases the force of the body by causing the combustion of other substances. It will be seen from this that what is a food to one person may not be a food to another; or that which is a food at one time may be a poison at another time; thus, to a person whose vitality is so nearly exhausted that more substantial substances cannot be assimilated, alcohol may be a valuable food, and such a person may be saved from death by the use of this much abused article. But to the healthy man alcohol is not a food, because it prevents changes in other substances. If a healthy man constantly takes alcohol with his beef-steak the former is changed in the body and produces a certain amount of force; but the alcohol prevents the complete oxidation of the beef-steak, and consequently the sum total of force acquired from taking the two is less than if the meat only had been taken.

Our foods are inorganic and organic; the latter class comprising nitrogenous, starchy and fatty foods. Inorganic substances, such as water, lime, common salt, etc., have no potential energy. They may aid in repairing or building up tissue, and they may aid in causing the liberation of force from other substances. But as force-producers *per se* their value is nothing.

It is generally supposed that nitrogenous food is best suited for the man who puts forth much muscular exertion. This view was first advanced by Liebig and it stood for a long time unquestioned. It taught that all, or the greater part, of our nitrogenous food was first converted into muscular tissue, and that muscular exertion was acccomplished at the expense of muscular disintegration; and that the muscle thus worn away must be repaired by new supplies of nitrogenous food. If this theory be true, muscular exertion should greatly increase the amount of nitrogen in the excretions. Fortunately all the waste nitrogen of the body, probably with the exception of an insignificantly small amount, is excreted in the urine as urea and uric acid. The amount of nitrogen thus excreted can be easily and accurately determined. Many experiments have shown that increased muscular exertion does not to any marked extent increase the amounts of urea and uric acid excreted. In other words, these experiments have shown that the force liberated by the oxidation of our nitrogenous food can account for only a very small part of the force which is necessary to the maintenance of animal heat and to the locomotion of the animal. During the summer of 1878, I made a number of experiments with a view of determining the relation of the excretion of nitrogen to the consumption of the same element and to the amount of physical exercise. For fifteen consecutive days I took the same amount and kind of food and drink; during the last five of these days, I collected my urine and carefully estimated the amount of nitrogen excreted as urea and uric acid. It should be stated that my food contained inorganic, starchy, fatty, and nitrogenous articles, but that the amount of each was the same for each day. The amounts of urea and uric acid excreted during the last five days were ascertained and the amount of nitrogen calculated, and the average for each day found. This comparison led to the following results:

First Period—Nitrogen of the food, 225.107 grains; Nitrogen excreted, 230.205 grains.

It is seen from these figures that the amount of nitrogen contained in my daily food and that excreted in my urine were substantially the same, the difference of about five grains being probably due to errors in analysis.

During the following fifteen days the meat of my food was lessened to such an extent that I received daily only 155.899 grains of nitrogen. During the last five days of this period the urine was collected and the nitrogen in the urea and uric acid estimated as before with the following results:

Second Period—Nitrogen of the food, 155.899 grains; Nitrogen excreted, 155.394 grains.

It will be again evident that the amount of nitrogen daily consumed and that daily excreted are substantially the same, and that variation in the amount of nitrogen in the food is followed by a corresponding variation in the amount excreted.

During the thirty days taken up with the preceding experiments I took little or no physical exercise; most of the day was passed in reading. Now during a third period of five days I took the same food as during the second period, with the addition of half an ounce of butter. The amount of nitrogen in the food was the same as in the second period. During this third period I walked eleven miles per day, at the rate of three miles per hour. The nitrogen of the urea and uric acid was estimated for the five days, as before, with the following results:

Third Period—Nitrogen of the food,. 155.899 grains; Nitrogen excreted, 149.129 grains.

It is seen from this that the excretion of nitrogen was not augmented by exercise. Similar experiments have been by Fick and Wislicenus, Parkes, Haughton, Voit, and others. While some of these have found the amount of nitrogen slightly increased by exercise, the increase has been very slight and sufficient to account for only a very small fraction of the work done. Therefore we must conclude that nitrogenous food is not the chief source of the force liberated within the body.

With regard to starchy foods, we know that the heat furnished by their oxidation is even less than that furnished by the combustion of lean meat.

Fatty foods are oxidized in the body and excreted as carbonic acid gas and water. The excretion of carbonic acid gas is greatly augmented by exercise, and the oxidation of fat furnishes more heat than the combustion of either starchy or nitrogenous substances. The oxidation of one pound of beef-fat will generate heat sufficient to raise 9,069 pounds of water 1°C.; while the oxidation of one pound of lean beef generates heat sufficient to raise 4,263 pounds of water 1°C.; and the oxidation of one pound of starch produces heat enough to raise only 3,912 pounds of water 1°C. Thus, we see that so far as potential energy is concerned, fatty foods are most powerful, while nitrogenous and starchy substances follow in the order given.

These scientific facts are followed to a certain extent instinctively by man. The inhabitants of tropical regions subsist principally upon fruits; while the Esquimau is compelled to consume large quantities of fat in order that sufficient heat may be generated within his body to enable him to withstand the severe and continued cold. The inhabitants of temperate zones should, and do, to a certain extent, so vary their food, as to receive the least amount of fat in the summer. Certain articles of food, such as fat pork, are absolutely out of season during the hot months of summer.

While nitrogenous food does not furnish so much force, this force can be liberated quickly and energetically. A carnivorous animal is suited for rapid and great displays of strength, but is without the endurance of the herbivorous animal. As Dr. Haughton has said, in a leap of 20 feet the tiger would display more energy and strength than the deer; but in a race of 100 miles, the deer would undoubtedly surpass. The North American Indian, a carnivorous animal, can spring upon his prey with the skill and dexterity of a cat. The Englishman of the 14th century consumed large quantities of flesh. This food best fitted him for immediate displays of strength, and he who could strike the heaviest blow quickest was the most fortunate man. Brought hand to hand with his foe, the blows of the battle-ax must fall fast and heavy. To-day, the struggle for existence is no less severe, but the battle is fought with wholly different weapons. Then an Earl of Warwick throned and dethroned kings by the strength of his arm; to-day, a Charles Darwin, in the face of popular prejudice, has won recognition from the great universities, not by the strength of his arm, but by the power of his brain. These changed conditions are accompanied by changes in the form in which force is liberated in the body. Nitrogenous food is a true nerve stimulant, and when used in excess unduly excites the nervous system.

There is abundance of evidence to prove that the processes of digestion, assimilation, and excretion proceed with more vigor *during the hours of the forenoon* than during any other portion of the day. There is a gradual increase in the vital action from early morning (from 6 to 8 A. M.) until about midday. After midday there is a gradual decrease in the activity of the vital forces. Organic life is most active, normally, during the hours of the forenoon. The following evidences of the truth of this assertion are offered:

1. The pulse is more rapid during the hours of the forenoon than at any other time of the day. This is proved by the experiments of Dr. Edward Smith. This untiring investigator kept records of the rate of pulsation in different persons for a long while. He found that in a child the highest rate of pulsation was to be observed about 9 A. M. The same he found to be practically true with three adults, aged respectively thirty-three, thirty-six, and thirty-nine years. It must be known that the rise just at this time was due partly to the breakfast, which was taken between 8 and 9 A. M. But the point worthy of notice is, that while this meal contained less stimulating food than the other meals of the day, still it had more effect upon the rate of pulsation than any other meal had. In the child above referred to, the rate of pulsation was increased 12.7 beats by the breakfast, while by the dinner and tea, it was increased only 6.3 and 2.3 beats respectively. In an adult aged thirty-nine, the rate of pulsation was increased 9.7 by breakfast taken between 8 and 9 A. M., 5 by dinner taken between 12 and 1 P. M., 1 by tea taken between 5 and 6 P. M., and 1.4 by a more stimulating supper taken between 8 and 9 P. M.

2. The amount of carbonic acid exhaled per minute generally is greater during the morning than at other times of the day; though the exhalation of carbonic acid is greatly increased by drinking tea, and when this drink is taken during the evening the amount of carbonic acid exhaled per minute may be greater than that exhaled at any other time of the day.

3. The amount of urine excreted per hour rises during the forenoon, and falls as evening approaches. This is independent of the kind and amount of

food and drink consumed. I found that when I took no food for thirty hours, the forenoon increase and the afternoon decrease were still manifest.

4. Food taken towards evening requires a longer time for its excretion than that taken early in the day. Food taken for breakfast generally manifests its influence upon the urine within forty or fifty minutes; while the dinner seldom affects the urine within less than two hours; and supper taken at six, P. M., seldom affects the urine until from five to eight, A. M., of the next morning.

5. The hourly excretion of urea is, other things being equal, greater during the forenoon than at any other time. This varies greatly though, with the amount of nitrogenous food consumed.

6. By some late researches, Vierordt has shown that the amount of oxyhæmoglobine in the system follows the laws of forenoon increase and afternoon decrease, as has been given.

From the foregoing facts it seems evident to me that the food selected for the various meals of the day should be suited to these varying conditions. The breakfast should consist of plain, substantial food. No stimulants of any kind should be taken at this time. Neither coffee nor tea should be taken by a healthy man for breakfast. Lean meat is also a stimulant, and if taken at all for this meal, should be consumed very sparingly. No doubt, but the majority of persons would enjoy much better health were they to take no lean meat for breakfast. The Germans seldom use it at this meal. Milk, bread, butter, potatoes and oat-meal or cracked-wheat are suitable for the breakfast-table. Eggs may be eaten, as the yolk contains a large per cent of fat. If much work is to be done during the day there is probably no other class of foods which, taken at the first meal, better fits man for his labor than fat. This should be taken in a finely divided state, as butter spread upon bread, or as bacon cut into thin slices. Indeed, good butter is an essential constituent of a good breakfast. Many fruits and berries may be taken with profit, either at or just before this meal. Oranges before breakfast are very beneficial to health. The bread may be either brown or white. If no meat be eaten at any time of the day, the brown bread is preferable, as it contains more nitrogen; but if much meat be eaten at dinner or supper, or if there be any intestinal irritation, white bread is the better. The bread may be either warm or cold, to suit the taste. Of course, it should not be taken into the mouth when hot enough to injure the teeth. The breakfast should be taken soon after rising, and no great amount of physical labor should be undertaken before partaking of this meal. The intelligent farmer feeds his laboring men and horses before they engage in any heavy work. It is probably useless to say that dessert, pies, cakes, etc., are out of place on the breakfast-table. Indeed, the common taste of man repudiates these articles of diet when offered early in the morning. The healthy man seldom needs any coaxing to enable him to eat this meal. Fortunate is the man whose breakfast of plain, substantial food is the most hearty, and the most enjoyable of his meals. Seldom is any one heard complaining of eating too much breakfast, and still more rare would be such cases if tea and coffee were banished from the breakfast-table, and if less lean meat were eaten at this meal.

Prof. Vaughan was tendered a vote of thanks for his able paper.

After the adjournment of the convention the members took sleighs, and in accordance with the invitation of Prof. MacIntyre, visited the Institute for the Deaf and Dumb. The visitors were shown into the chapel where the methods of teaching were explained, and illustrations of results were given. These proved very interesting to the visitors, and after an hour of class and individual recitations by the scholars, the visitors were led to the dining hall where an elegant lunch awaited them. After the lunch many took occasion to look still farther about the buildings. The return to the city was made in time for the afternoon session.

FOURTH SESSION, WEDNESDAY JANUARY 26, AT 3 P. M.,

J. B. Atwood, of Flint, in the chair.

The first paper of this session was "A Plan for a Board of Health for Detroit,"* by Prof. Henry F. Lyster, M. D., member of the State Board of Health, of Detroit. The paper is as follows:

PLAN FOR A BOARD OF HEALTH FOR THE CITY OF DETROIT.

BY PROF. HENRY F. LYSTER, A. M., M. D., OF DETROIT.

A very large majority of the people in every community, probably ninety out of every hundred, are willing to let the remaining ten think and act for them in most matters affecting the public interest.

In sanitary matters the proportion is still greater, and there barely remains, per centum, the fraction of a man to go into the vineyard and work, and he not unfrequently delays until the eleventh hour.

It was recently observed by a prominent sanitarian, no less a personage in fact than the Vice-President of the National Board of Health, to the effect that it is not always the best individual out of a possible hundred, who engages in this work, who turns aside from the beaten paths of money-making, and the stereotyped duties of professional life to assume the office of sanitarian, and engage in the service of the public as health-counsellor.

However disparaging this criticism on the standing and ability of those interested in matters pertaining to public health, and admitting its force, it could probably as truly be made in regard to any other affair of general interest. For instance, we do not always find in the political arena those whom the people would naturally delight to honor, and into whose keeping they would by preference entrust the jewels of liberty. The shadow of a successfully manipulated caucus sometimes throws a bar sinister across the pure ermine of a judge or upon the snowy toga of a legislator whose reputation improves as the square of the distance from his constituency increases.

If we should in a spirit of republican leveling dare to invade the classic grounds of the three learned and sacred professions which cycles of Latin and bi-cycles of Greek have enveloped in mysticism, and adumbrated in a vail of obscurity, requiring years of lexiconical toil to penetrate, how often would we be obliged in simple justice to place the minister in the pew, and the unlettered believer in the pulpit in order to get the kernel of truth from the husk of the parable—the application to our poor out-reaching humanity of the miracles worked by the shores of Galilee! How frequently might we not with profit to ourselves and to the law-abiding, remove the gown and wig from the forms of the dispensers of justice, and giving into their hands the paternal plow, adjure them not to look back! Are there not those soaring about in the upper ether of the medical atmosphere with all the buoyancy of apparent success, and all the inflation belonging to their exalted position, who, were they stripped of their borrowed plumes, and left with only the pin-feathers, as it were, belonging to them, would come down proportionately, according to the established laws of gravitation, and be forever consigned to lower depths in space than that inhabited by many of their luckless patients?

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* [Dr. Lyster was chairman of a committee appointed by the State Board of Health to devise a plan for a Board of Health for the city of Detroit and to labor for its establishment. I take pleasure in stating that the agitation of this subject brought about legislation,—the Legislature of 1881 passed a law creating a Board of Health for Detroit, which, although not quite according to this plan, will do good service in the cause of public health.—H. B. B., Sec. S. B. of H.]

We have this consolation at least left to us who have engaged in public sanitation, that if those who are more able, and better qualified for the duties and responsibilities will only come forward, and undertake the work, we will very quickly fall in with the rank and file, and leave the official positions to them, with all honors and emoluments pertaining thereto.

The plan I have to propose for the organization of a Board of Health for the city of Detroit will, with certain modifications in regard to the size of the board, suit it to cities of a greater or less population, and it has been designated as intended for Detroit, for the reason that just at this period of its history that city is destitute of any form of health department. The sanitary squad of the police can hardly be regarded in the light of health officers, and at most can abate nuisances coming to their attention, particularly if detected by the sense of smell.

It may possibly be considered by some present that a subject of this kind would, from its local interest, be foreign to the work of this convention, but upon reflection, the sum of the local work in any department is that from which we deduce our general results. A large city is a very important factor in a sanitary point of view, for all the surrounding country. It is an aggregation of thousands of people, and becomes the source from which arises many forms of contagious disease, and a center from which they are disseminated through the arteries of commercial travel, far and wide. The fact that the people are crowded together within a small space makes them so much the more dangerous, from the facility with which contagious diseases are progagated from one to another, during their prevalence from month to month, and from year to year. The rapidity of transit at the present time renders this condition of affairs more important than formerly; for during the period of latency, after the reception of the poison and before the patient is really aware of his illness, he may be transported hundreds and even thousands of miles; and it not unfrequently happens that the patient, recently suffering from some form of contagious disease, who has recovered sufficiently to travel, may leave a train of poison extending by passenger coaches, sleeping cars, and steamboats, through several States, from the bed of sickness to the summer resort or sanitarium. It may be generally accepted as a fact, that sooner or later the present anomalous condition of affairs regarding the public health in the city of Detroit will be changed, and that some sort of supervision will be determined upon. A city, including the immediate environs, of 130,000 inhabitants, increasing as it does in population at the rate of 5,000 per annum, can hardly be expected in this day of active sanitary supervision and work, to continue apathetic in a matter of such vital importance. The old slow-coach reputation of the city, which has of late years given place to a sort of semi-Chicago air of enterprise and advancement, still clings to the department of public health. The evils attendant upon a want of any system, are, all things considered, no worse than those which belonged to the unwieldy and inefficient boards of former years. Now we know that there is nothing between disease and the people, when in those days it was supposed that what was called a board of health, was such in fact and deed; whereas it was a board composed of the senior alderman from each ward, two city physicians and two other physicians in general practice, with the city clerk as secretary. This board met semi-monthly and discussed such measures as were brought before it, with the average amount of enlightenment upon such matters as is found among aldermen all the world over. The board was simply advisory to the common council, and had no authority vested in itself. It was a large and unwieldy body, of no more service to the city in the prevention or limitation of disease than that which was derived by the publication of its proceedings in the daily papers in calling attention to some flagrant nuisance. In times of the spread of epidemic or endemic disease the board would have been utterly worthless, as it was, in the management of the hidden influences which are daily and hourly at work, and do not appear openly, but enter the dwelling like a thief in the night, and are dealing with the people in their homes, in the hotels, the schoolhouses, and factories. The board, composed as I have described, had not the slightest conception of its duties, and remained a light-house without a lamp, which could be seen in the daytime when the sight of the rocks and reefs was sufficient to keep away the mariner and his ship, but at night disappeared with the setting sun.

THE PROPOSED PLAN OF ORGANIZATION.

One health officer.
Four assistant health officers.
One executive officer (sanitary engineer).
One clerk.
Four employees.

The officers of the board shall be appointed by the common council on the nomination of the mayor, and shall receive reasonable salaries.

The duty of the health officer shall be to organize the board and the work of the several members, and to supervise it in all its departments; to study the work of sanitary boards throughout the country and those of other nations; to be not only thoroughly informed upon sanitary ideas and methods, but to keep the work of the board up to the plan of the highest and most scientific enlightenment. He should so systematize and regulate the statistical material, and the methods of its collection and preservation, that it could be made constantly available for the general service of the public as well as by sanitary organizations. The reports of the board should be made over his signature, and should be published as often as the interest of the public demand. A report should be annually submitted to the common council. The health officer should make arrangements for obtaining health reports from other cities and States through a system of exchange, and in this way construct a library of reference. The standard authorities, and works on sanitary science should be obtained by purchase from time to time as they appear, for the use of the members of the board. The health officer should be held officially responsible for the efficiency of the board, and should be the medium of any and all official communication between the city government and the board.

The assistant health officers should act under the direction of the health officer in their several districts, and should constitute, with the health officer and sanitary engineer, the board. When directed to do so, they will be required to act in any of the other districts, either singly or in consultation with the health officer of that district or with any or all the members of the board. During a vacancy, or the absence of the health officer, or when from any cause he is unable to attend the meetings of the board or to perform his official duty, the senior assistant officer on duty shall temporarily act as health officer. The assistant health officer shall investigate and report upon all cases properly coming before him in his district, and shall report his action upon the same day to the executive officer of the board. He shall see that the reccommendations and orders of the health officer are properly complied with and carried into effect in his district.

The executive officer of the board, who shall be a sanitary engineer, shall carry out with the aid of the employees and such other aid as may be afforded by the police department, the orders of the health officer. He shall make such investigations in regard to all that pertains to the department of sanitary engineering as may be required by the health officer, and shall make such suggestions and recommendations as from his special knowledge as a sanitary engineer he may be enabled to do. Besides the especial work appertaining to a sanitary engineer, he should be the executive officer of the board, and should, under the direction of the health officers, perform such duty as shall be required in the proper performance of his office. The clerk shall be appointed by the health officer, and shall be on duty in the office; he shall receive and place on file all complaints and notices received, and shall send out notifications and instructions of the board, keep the records of the office, and conduct the correspondence, and do and perform all such other work as would naturally devolve upon a clerk. He shall attend the regular and special meetings of the board, and keep a record of the meetings, and a copy of all official papers. He shall have charge of the library and records of the board, under direction of the health officer, and shall be responsible to him for all his acts as a clerk of the board.

The employees of the board shall be day-laborers who shall act under the supervision of the executive officer in performing such manual labor as shall become necessary in carrying out the orders of the board. They shall be competent and efficient workmen, selected for their intelligence and skill, and aptitude in receiving the instructions and performing the work ordered. The number of employees may vary from time to time, depending upon the work of the board. Upon the organization of the Board, or as soon after as may be necessary, there shall be two (or not more than four) appointed.

The bill prepared in accordance with the plan above stated, which was introduced in the Legislature but displaced by the act on page 61, is as follows:—

A BILL to provide for the establishment of a Board of Health for the City of Detroit.

SECTION 1. *The People of the State of Michigan enact*, That there shall be appointed by the common council of the city of Detroit, on the nomination of the mayor, on the third Tuesday of July, A. D. 1881, three persons, freeholders, electors and practicing physicians of said city, who shall be and constitute a board of officers of said city to be known and designated as the "Detroit Board of Health." Said persons shall hold their office for the term of one, two and three years respectively, from the first day of July, A. D. 1881, and the one appointed for three years shall be the president of said board, and shall otherwise be and be known as health officer of said city. On the third Tuesday of June in the year 1882, and on the third Tuesday of June in each year thereafter, there shall be appointed, in the manner above provided, a member of said board for the term of three years, with qualifications as above required for persons first appointed. The president of said board shall always be the health officer of said city, and when the office of president shall be vacant by reason of the death, resignation, or otherwise, the same shall be filled by a majority vote of the members of said board, and in case said members shall not agree in the manner provided for filling such vacancy, the member of said board having the shortest time to serve shall act and be the president thereof until such vacancy is filled by the vote above required.

SEC. 2. The said board is hereby empowered to employ and appoint a secretary, a sanitary engineer, and such other agents as from time to time may be found necessary, and as may be authorized by the common council of said city. The members of said board, their secretary and sanitary engineer, before entering upon the discharge of their duties, shall take the constitutional oath required of other city officers, and shall enter into bond to the city of Detroit in the sum of $5,000 (five thousand dollars) each for the faithful performance of their respective offices, which bond shall be subject to approval by the common council, the same as bonds of other city officers. In addition to the qualifications above required, the members of said board and the sanitary engineer must have the certificate of the State Board of Health, showing their fitness by reason of special and extended study of sanitary science and experience in sanitary matters, to undertake the important duties of the position proposed to be conferred upon them.

SEC. 3. The members of said board, their sanitary engineer, secretary and other employees, shall receive such compensation for their services as shall be provided by the common council of said city. As to removals from office, vacancies and suspensions, the same rules shall apply and proceedings be had as in case of other city officers. The said board shall thoroughly classify and systematize its business and operations, shall adopt such by-laws and regulations for its own and the government of its employees as may be deemed necessary, and shall keep a complete record of all its proceedings, operations and expenditures in books for that purpose provided; which books shall at all times be open to inspection by the mayor, controller, or any committee of the common council.

SEC. 4. The said board on or before the first day of March in each year shall report to the controller an estimate of the amount of money required to defray the expenses of said board for the ensuing fiscal year, which estimate shall show the sum required for salaries and other purposes in detail and be transmitted to the common council by the controller with his other annual estimates. The common council shall have power, the board of estimates concurring, to raise by taxation the amount so estimated each year, or such portion thereof as may be deemed necessary, in the same manner as other general city taxes are levied and collected.

SEC. 5. The object of the establishment of said board is the strict enforcement of sanitary regulations, and the maintenance of public health in the city of Detroit, and to this end the common council shall have full power to pass and enforce all needful ordinances and to compel all physicians practicing in the city to report promptly to the said board all deaths and all cases of infectious or contagious diseases occurring in their practice, and the said board of health shall have full power and it shall be their duty to take note of the violations of all ordinances relating to the public health and see that complaints are promptly made thereof; to make a careful examination of all buildings, localities and premises where contagious or infectious diseases exist or are liable to originate; to take such steps and proceedings as may be deemed necessary and reasonable to prevent the introduction, existence and spread of such diseases; to examine sewers, drains, privies, vaults, cellars, basements, and all low lots, premises and places where nauseous, unhealthy and unwholesome smells exist, or are liable to be, and to do all things necessary for the prompt and thorough renovation of the same, and, when deemed necessary by said board for the purpose of discharging their duties as above stated, the members thereof, their sanitary engineer, secretary and other employees, shall have full authority to enter upon both public and private property, also to isolate or remove to safe and proper places or hospitals persons suffering from contagious or infectious diseases, to seize, remove, disinfect or destroy infected clothing, materials or articles, and to summarily remove and abate all nuisances causing sickness.

SEC. 6. The city physicians of said city shall be appointed by the common council on the nominations of said board, on the third Tuesday of June after the year 1881, and shall in all matters of public health and sanitation co-operate with the said board and report to it and be under its direction. Said board shall prescribe in detail the duties of their sanitary engineer and secretary and shall have and keep a full and complete record of the deaths of all persons dying in the city, including the dates and causes of death, places of burial, places of birth, ages of the deceased and names of attending physician and undertakers, and also a record of the causes, incidents and circumstances of all contagious, epidemic or infectious diseases originating or prevailing in the city.

SEC. 7. The said board at the end of each month shall report to the common council in detail the amount and cause of all their expenditures during the month, the number and causes of death of all persons dying during the month, the places of burial, nuisances looked after, and matters investigated. On the first day of July in each year, the said board shall present to the common council a report showing clearly and fully all their operations during the year, with such information and recommendations as they may deem important and necessary.

SEC. 8. It shall be the duty of the meat inspector and of the members of the police force of said city to aid to the utmost of their power the said board of health, the sanitary engineer and secretary in the performance of their respective duties, and on requisition of the health officer it shall be the duty of the superintendent of police to detail one or more policemen to serve the notices of said board and health officer, and to make complaints for violations of the health ordinances of said city.

SEC. 9. The expenses of said board shall be paid out of the general funds for such purpose, provided upon claims and pay-rolls duly certified by said board and by warrants of the controller, the same as other expenses of the city are paid.

It will be observed in the plan which I present to you, that an attempt has been made to organize a board capable of scientific work, and to eliminate from it all extraneous or incapable material. With the exception of the sanitary engineer, who is also the executive officer of the board, it is composed wholly of physicians, solely for the reason that they are the best qualified from their professional study and training to undertake the work of limiting disease and promoting the public health. This I believe to be an axiom, and can it hardly admit of any difference of opinion? Certainly not to those who will reflect for a moment upon the proofs of the argument. I say this with all due respect to the two other learned professions. The church has lent its powerful aid to all that is good in human affairs, and in many notable instances the pastor has come down from the pulpit, and joined with the flock in the solution of temporal questions. He has buckled on the sword, and shouldered the musket from the old colonial times down to the day when company "F," of the Second Regiment left this city to join the Michigan colors on the Potomac. His voice has been heard among congressmen and legislators, and if he is less a ruler and a judge than in former generations, he is none the less efficient in doing good, and in each year becoming more and more interested in the general welfare of the people. We find him here, and you will see him an active and earnest worker in everything for the amelioration of the condition of the people. His intelligence and education eminently fit him for undertaking sanitary work, and yet he understands that unless he qualify himself by long and patient special study, he must defer to the physician, especially in that department relating to the limitation and prevention of disease. The same reasoning will apply to the profession of law, as well as to intelligent persons generally who have not made the various forms of disease a special study. The members of the board should then be selected from physicians as a class, with the exception of the sanitary engineer, and he should be required to qualify himself by special study in respect to the history of contagious diseases, and the life-history of disease-germs, and such other knowledge as would necessarily appertain to his duties. His course of study as a sanitary engineer would have instructed him in most if not all that belongs to the department over which he would naturally have the supervision. The chief authority, according to the plan proposed, is left in the hands of the head of the board, the health officer, in order to make the working of the board more efficient, and to enable the responsibility to be fastened upon one person. Where there is a concentration of power there is usually more efficiency; the duty is not so easily transferred from one to another. The health officer can have the advantage of consultation with the other members of the board as he desires in cases of considerable moment; and the several members can call upon him in such cases as they may determine. In order to give a higher standard of qualification to the board, it would be desirable that each member be required to hold the certificate of the State Board of Health, to show that by special and extended study of sanitary science, he was fairly qualified to undertake the important duties of the position as a member of the city board of health.

A TOPOGRAPHICAL AND SANITARY SURVEY.

In outlining the work of the proposed board, a topographical and sanitary survey of the city and its immediate vicinity should be made at the earliest possible moment, and a study of the water-supply and the sewage and drainage system and gas-piping should be made. Large and accurate maps of this work should be made for the use of the board. In a sanitary map of the city and suburbs, each house should be located by street and number, and after inspection by the sanitary engineer, a detailed and accurate description of it should be entered upon the records of the office, describing its construction and the water and sewage connections, drainage, methods of heating and ventilation, and classifying it in regard to its prospective healthfulness.

RESTRICTIONS ON BUILDING.

The necessary ordinances should be passed by the common council, authorizing no new buildings to be constructed without the plans having first been approved by the board of health, and no additions, alterations, or changes to be made in houses already constructed, or in water or sewage connections, without the permit of the board of health. Neither should any house be rented or bought or sold unless the owner holds the certificate of the board as to its healthfulness. By means of this classification and grading of houses and premises, aided by a system of inspection, houses which are known in the neighborhood as being unhealthy, and which have been vacated on this account, would not be occupied again until a permit could be obtained, certifying as to their healthful condition. This would be one of the most important steps in the direction of the prevention and limitation of disease. Most, if not all of us, upon reflection can point out at least half a dozen residences that have been plague-spots, year after year, and out of which have come the victims of typhoid-fever, rheumatism, dysentery, intermittent fever, scrofula, pulmonary consumption, pneumonia, and erysipelas, besides enfeebled constitutions unable to resist the pernicious influences of the location, where an unwholesome cellar, an imperfect drain, or a poisoned well, may have been important factors in what are termed "mysterious visitations of Providence." It may not be out of place to mention in this connection some instances of this kind which have come directly under my own observation. In one family the children grew up with weak and scrofulous constitutions, and after many hair-breadth escapes from croup, inflammatory rheumatism, and scarlet-fever, have most of them since succumbed to consumption, all of which was invited and superinduced by a wet cellar and over-shaded dwelling. In another house completely secluded from the sun by its position three children died of diphtheria. In another two children having died of scarlet fever, the parents concluded to utilize the room made thus available, by taking lodgers. The apartments were rented, without any previous disinfecting, to a family recently arrived in town. Two of the children were taken ill with scarlet fever shortly after settling in the new home, and recovered only after a severe illness.

In another case the damp and low position of the dwelling has been the cause of repeated attacks of dysentery, and intermittent fever, among the inmates who own the house, and who are not able from poverty to improve it, and will not move out. In another residence, a two story and basement brick house, where an open box-drain was discovered to traverse the length of the house immediately beneath the kitchen and dining-room floors, two of the children died of diphtheria, and the family, convinced at last of the unhealthfulness of their dwelling, moved out, leaving behind them a large placard on the front door, "To Rent."

Associated with the board should be a chemist who should be competent to make (for a small fee) analyses of such articles of food, medicines, etc., as may be suspected of adulteration. Also a public prosecutor whose duty it should be to prosecute for the government all cases where fraud has been discovered. This plan is now carried out in Great Britain and upon the Continent, and has been productive of great good in the protection of the people from pernicious and adulterated food, etc. The field is not so limited in this matter as many suppose, and it is not only the poorer consumers who suffer. The investigations in this respect by the State Board of Health, while hitherto very few in number, have shown that the American market needs this supervison almost as much as the European. The city counsellor should be the legal adviser of this board, as he is of the other branches of the city government.

OTHER DETAILS.

The cleanliness of the city should be under the direction of the board of health, while the carrying the orders into effect, might remain in the hands of the board of public works. The same might be done in regard to the management of the public sewers. The details of the methods by which reports of prevailing and contagious diseases should be obtained, and the daily publication of the same, as well as the registration of births and deaths, the management of the funerals of persons dying of contagious disease, the placarding of houses where patients were ill with contagious or infectious forms of disease, might be left to the wisdom of the board of health.

In the argument regarding the establishment of such a board as has been proposed, it might be objected that the expense would prevent its adoption, that it would be oppressive in its action, would invade the home, and infringe upon the liberty of the individual. But these adverse opinions could be met by an intelligent exposition of the plan, and each objection overcome, would only serve to strengthen it upon the true foundation—the greatest good to the greatest number.

The paper was discussed briefly by Drs. Fairbank, Smith, and Baker.

By request of Dr. Lyster, the act establishing a board of health for the city of Detroit is here appended:

[No. 399 Local Acts, 1881.]

An Act to provide for the establishment of a Board of Health for the city of Detroit.

SECTION 1. *The People of the State of Michigan enact,* That there shall be appointed by the common council of the city of Detroit, on the nomination of the mayor, on the third Tuesday of June, eighteen hundred and eighty-one, three persons, electors and practicing physicians of said city, who shall be and constitute, together with the mayor, controller and president of the metropolitan police commissioners of said city, a board of officers of said city to be known and designated as the "Detroit Board of Health." The mayor, the controller, and the president of the metropolitan police commissioners shall be *ex officio* members of the said board of health. The three physicians first appointed shall hold their offices for the terms of one, two and three years respectively, from July first, eighteen hundred and eighty-one, and annually after the year eighteen hundred and eighty-one, on the third Tuesday of June, a member of said board with like qualifications shall be appointed, on the nomination of the mayor, for the term of three years. Vacancies in said board shall be filled in the same manner that appointments are made as herein provided for. The board of health thus constituted, for the purposes of organization and management of its department shall have all the authority of other boards in said city and ordinarily pertaining to such bodies, and also to appoint a secretary as an executive officer who shall be known as the health officer of said city. The health officer shall be selected with special reference to his knowledge of chemistry, hygiene, and sanitary matters, and shall devote his whole time to the sanitary condition of the city and other duties as prescribed or required by said board. Said health officer may be removed from office by the board of health, two-thirds of the members thereof voting for such removal.

SEC. 2. The members of the said board of health shall serve without compensation, but the health officer shall receive an annual salary not exceeding ($3,000) three thousand dollars, as may be determined by the common council of said city.

SEC. 3. The said board, on or before the first day of March of each year, shall report to the controller, to be by him transmitted as other estimates to the common council, an estimate of the amount of money necessary to defray the expenses of said board in preserving the health of said city during the ensuing fiscal year. The common council shall have the power to raise by taxation the amount so estimated, or any such part thereof as may be approved each year, in the same manner as other general taxes are levied and collected. The common council shall also have full power to pass and enforce all needful ordinances for the regulation of the sanitary condition and preservation of the said city.

SEC. 4. The city physician [physicians] of said city shall be appointed by the common council, on the nomination of the said board of health, on the third Tuesday of June after the year eighteen hundred and eighty-one, and shall in all matters of public health and sanitation co-operate with and be subject to said board of health.

SEC. 5. On the first day of July in each year, and at other times when required by the common council, the said board shall present to the said council a report of their operations during the year, with such information and recommendations as may be deemed important and necessary.

SEC. 6. From and after the second Tuesday of January, eighteen hundred and eighty-two, all power herein delegated to the common council relative to the confirmation of members of said board shall be exercised by the city council of said city.

Ordered to take immediate effect.

Approved May 26, 1881.

The next paper was by John S. Caulkins, M. D., of Thornville, on "Forests and Trees as Sanitary Factors." It is as follows:—

FORESTS AND TREES AS SANITARY FACTORS.

BY JOHN S. CAULKINS, M. D., OF THORNVILLE.

The influences of the trees and woodland of a country on the health of its inhabitants are considerably greater than will appear at first sight, to those that have not given much thought to the subject. It may even seem as if there were no intimate connection between the two, and that the subject might be slightly out of place before such a convention as this, but a little study will satisfy all that there are few topics bearing on sanitary science that better deserve the investigation, of which it has as yet received a very limited amount. Perhaps, then a few minutes could be spent to no better advantage than in reviewing what is known concerning the relations that exist between timber or the lack of it, and health or the lack of it.

In going over this ground, attention will be mainly given to some of the more obvious of these relations—that is to say, to such diseases as can be fairly shown to be directly attributable to the lack of trees. Afterwards it will be well to glance at the work that is needed to be done to elucidate the whole subject and reduce it to a science. The practical result of the inquiry will be a timely hint not to use up too fast the trees that are yet left of the original forest, and to plant more in places where they are needed.

Are there, then, any diseases that are caused by, or made worse by, a lack of timber in a country?

Is there any danger that Michigan, a wooded country, can ever be affected by such influences?

Both questions must be answered affirmatively. That there are such diseases, and that Michigan is already affected by one of them, will be shown in the sequel.

There is already collected by travelers a sufficiently large body of facts proving that treeless countries are peculiarly subject to diseases of the eyes, and there are obvious reasons for this. It can be predicated of a treeless country that it is a rainless one, and, unless facilities for irrigation exist, necessarily a desert. The sand storms to which such districts are subject is one of these causes. Owing to the increased force of the wind from the lack of the wind-breaks which forests make, immense quantities of the finer portions of the parched soil are raised into the air to irritate and wound the conjunctival membranes of the unfortunate eyes exposed to its injurious effects. Another and still more efficacious cause is the constant glare of the sun unrelieved by the green which during the summer is the prevalent tint of the landscape in the wooded districts. It must be admitted that this cause would not operate so severely in our latitude as it would farther south, where the solar heat is greater and more prolonged, but our winters would be worse. The glare of snow is almost or quite as bad for weak eyes as the glare of the sun. The visual organ soon becomes excited and wearied by looking at an unbroken and unvaried expanse of glittering white snow, and if we should be compelled to lose from the scene the neutral brown tint which the naked woodlands bear in winter, the effect on our eyes would be damaging in the last degree; for it is this subdued brown that more than any other tint relieves the snow-dazzled sight.

It is needless to enlarge in this place to any great extent on the inestimable value of our eyesight, for we all recognize it as the most precious of our senses, and wish to retain it as far as possible unimpaired during the remainder of our stay on this planet, and teach those that come after us how to do so. We must therefore look with uneasiness and alarm on any measures that may seem to us to tend to assimilate our country to the conditions of those where ophthalmia makes its permanent abode. The wholesale destruction of woodland is such a measure, and will be followed here as well as elsewhere by its attendant consequences.

Whether the above reasons are the true ones or not, the fact exists that the desert regions of Syria, Arabia, Egypt, and to some extent the Cape Verde Islands are the home of malignant ophthalmia. That a causal relation exists between the two conditions is too palpable to admit of much dispute.

Michigan is yet far from being so denuded of its trees as to place it in the same category with the above-named countries, but there is danger that it may in the future approximate to their condition, a result that will be rapidly hastened unless something is done to conserve what there is left of the original forest that once covered the State. There can be no doubt, and it is an alarming fact, that the tendency is, in the minds of the agricultural community, to think that it is not necessary to save much timber, believing it to be poor economy. Their argument is the undeniable fact, that the year's fuel can be procured with less labor by purchasing the needed amount with the proceeds of the crop which the cleared land would be capable of bearing. The trouble with this plan is that it defeats itself, for if every one acted on it there would soon be no wood to be bought. Coal, to be sure, could take its place, but would be necessarily much dearer.

Another class of diseases which is almost equally with ophthalmia prevalent in dry and treeless countries includes such skin maladies as leprosy. This has been commonly thought to be a disease of torrid climates as such, but recent observations show that heat alone is not the cause of it. That it depends on something else than heat for a cause is shown by the fact that while the disease is constantly seen along the arid shores of the Mediterranean sea from Tunis to Egypt, it is never met with in the well-timbered country of Abyssinia, although that is several hundred miles nearer to the equator, where if torrid heat is the cause the malady ought to be seen in a worse form than in more northern latitudes. This incurable disease is one of the most loathsome with which unfortunate man is afflicted, making life a burden to its victim. Cases of it are rare among us at present, and it is to be hoped that this may never be otherwise.

We come now to a disease to which the first part of the above remark will not apply, for it is common enough, the most common indeed of any, constituting more than fifty per cent of the total sum of sickness, and of which, if we cannot say that it is caused by the lack of trees, we can truthfully say that it is abated and sometimes stopped by their presence. I mean, of course, our ordinary autumnal or intermittent fever. Common as this disease is, its cause is obscure or, more properly speaking, unknown to us, since none of our senses, aided by the finest chemical analysis and the best lenses can detect it in air or water from infected localities. The best we can do is to adopt the Italian name *malaria ānglic,* "bad air," and study the conditions that govern it. Considerable is already known of these conditions, enough to show that the name is not inappropriate, for the poison is evidently aerial, that is to say, it rises into the air from the ground, principally in the night, heat and moisture being necessary conditions for its production. Having risen into the air the malaria will spread out laterally for perhaps half a mile without wind if very concentrated. How far it will travel with the wind is not definitely known, but if the poison is very much concentrated the distance might approximately be stated at five miles if the way is clear, but if it meets with a belt of trees in foliage, its progress is effectually barred. There is no doubt whatever resting on this statement: Trees do have the power, certain kinds at least and probably all to some extent, of purifying the atmosphere by absorbing or neutralizing its malaria; they are malaria eaters or killers, most likely the last, the active agents being their leaves. This fact was known by Lancesi, a Roman physician and the original authority on malaria, about two hundred years ago; has been noticed since his time by other observers, but has not till quite recently been turned to any practical use, or at least not to much extent. Lancesi, himself, attempted it, but was defeated by the ignorance of those to whom he gave advice not to cut away the timber that fringed the Pontine marshes. These marshes lying south of Rome are of great extent and scarcely any part of the earth's surface is more pestilential, the virulence of the poison that rises from them being so great that cattle cannot be pastured on them during the summer. It seemed that the head of the Roman church at that time, Pope Benedict, wanted timber to use, and thought to cut away a certain wood that separated the marshes from the villages beyond. Lancesi advised the pope not to cut the wood, telling him what the consequence would be if he carried out his intention, but his memorial was disregarded, the wood was cut down, and a fever immediately broke out that drove the inhabitants from their previously healthy homes. Some very striking instances of the salubrity of trees have been observed in British India; but in spite of all such, it is only quite recently that men have ceased to think that they were obliged to live and shake with the ague or die as they best could, without utilizing this valuable property of trees for their own protection, while compelled to remain exposed to malaria.

It is the French nation, to whom humanity is indebted for so much, that first bethought itself to turn to use this salutary power of trees. They soon found, after beginning their Algerian campaign, that the fevers of the country were so pernicious and endemic that white men could hardly live there, certain localities being so pestiferious that it was merely equivalent to a sentence of death to send soldiers or white residents to occupy then. Trees having been set out around such places, it was found that while yet nothing but bushes they caused the fevers to disappear and the spots to become perfectly wholesome, the plantations being made with the Tasmanian Blue Gum or Australian Fever Tree, botanically the *Eucalyptus globulus*. This tree was discovered and brought to France by the naturalist with the hard name, of the expedition that went out in 1791 in search of La Perouse. It forms with its allied species a large part of the forests of its native land, the districts where it grows being remarkable for their salubrity. For half a century after its introduction into Europe, it was looked at merely as an object of curiosity or ornament, and having been introduced to some extent into Algeria about twenty-five years ago, its fever-protecting property was soon noticed, and in 1861 a Frenchman by the name of Ramel imported a quantity of the seed from Melbourne, which was extensively planted through the province with immense benefit to the health of the inhabitants. Among the worst of the sickly places was Purdock, on a small swampy stream called the Hamise, near the city of Algiers, of which it was said that during the fever months the inhabitants "died like flies." A plantation of 1,300 eucalyptus trees was made, which by the time, only a few months, that they had grown to be nine feet in height, permanently drove the fever from the place. The village of Gue, near Constantine, had a like evil repute, being so infested with fever that Europeans could not live there; having been surrounded with a belt of eucalyptus trees it became very healthy. There were large swamps near Constantine which gave off such a deadly malaria that their neighborhood was dangerous to approach; these swamps having been planted with 14,000 eucalyptus trees are no longer infested with fever. In the south of France, Department of Var, was a railway station notorious for giving the employees the ague; forty eucalyptus trees made it as healthy a station as any on the road. Equally favorable results have followed the planting of these trees in other places, as Corsica, in some parts of Spain, and recently by some French Trappist monks in the Roman Campagna. There is good reason for believing that wherever they will become acclimated they will afford effectual protection against paludal fevers.

We cannot flatter ourselves that this tree can ever be naturalized so far north as Michigan, but as all trees have the same power to some extent, we must use such as we have till we find out which is the best. There must be in the Great

Dismal Swamp some tree that possesses anti-malarial qualities to as distinguished a degree as the eucalyptus, if it is true as claimed, that the district is healthy, for certainly it might be expected from the conditions of heat and moisture prevalent there that the locality would be intensely malarious. The juniper abounds in this swamp to such an extent that the water is colored by its roots. Perhaps it is the juniper that possesses the anti-malarial properties, but if it is not, some other tree growing in the swamp has them; else it is an incomprehensible phenomenon that there should be no ague where the ground is saturated with water and the thermometer stands at 90° for weeks. If the inhibitory power is not in the trees where is it?

Some parts of Louisiana are very free from ague, although the country is low and swampy. The ditches, bogs, and bayous there are full of a creeping water-plant, the *Jussœa grandiflora,* and it is to its presence that the exemption from fever is attributed. It is such facts as these that we need to look for and carefully study.

The planting of trees is not advocated as the alternative or substitute but the complement of good drainage, the immense importance of which to good health it is not intended in the above remarks to under-estimate. There are some facts that show, and facts were always called stubborn things, that drainage alone cannot be relied on to keep a country free from fever. These facts may grouped under two cases:

Case 1st—Where drainage is impracticable.

Case 2d—Where it is practicable and exists but is inefficient for protection.

Case 1st includes artificial ponds or swamps caused by damming streams for economic purposes, such as millponds, cranberry swamps, fish ponds and the like, and naturally formed swamps or overflowed lands that lie too low to have an outlet, especially such as lie around the estuaries of rivers where the tide comes in. For the sanitarian a millpond is a nuisance to be abated. It is all right to use water power to do work where there are natural falls or rapids in a stream, but to stop the current with a dam and drown a thousand or two acres of land for the sake of getting the necessary fall is something that in time an enlightened community will not permit to be done. While they are allowed to stand, which may be for a long and indefinite period, millponds and all overflowed tracts should be well fringed with rapid-growing trees, to intercept the emanations from the stagnant water. Willows and osiers should be planted in the edge of the water, then tamarack, and farther back butternut, or other quick growers. When the country becomes rich enough, the time will arrive that many of these overflowed tracts will be reclaimed by the construction of dykes along the shore of the overflowing body of water and the pumping of the stagnant water out, but such half-dried places will remain malaria-generators and demand the protective influence of trees.

We come now to case 2d—where all of the conditions of good drainage obtain, but still chills and fever are rife. What shall we say of it! It would not be surprising, so much has been written about drainage, if the nearly unanimous reply to this question should be that it was a theoretical case and only existed on paper; but such an answer would be erroneous. The case is an actuality and is only to be met with in timberless countries. The Spanish Peninsula is a conspicuous instance of a dry but sickly country. The British army, during its campaign against Bonaparte in the Peninsula, suffered from fever to an unprecedented extent, some of the most arid plains being the sickliest. The medical histories of wars in foreign countries give numerous instances of deadly fevers occurring in dry localities, but not to take time in citing these, attention will be called to an instance of the kind in our own country.

Below will be found a quotation from a paper read at the sanitary convention held at Detroit, January 7th, 1880:

"In ague and other diseases caused by malaria, drainage holds the same position as a preventive measure that vaccination does in the small-pox, but occasionally the best drained sections of country suffer from severe epidemics of malarious diseases. An instance in point of this fact can at present be noted in a part of Orange county, N. Y., twelve miles west of Newburg, where chills and fever, formerly a rarity, are now common and severe, even pernicious and fatal, although the locality is hilly, free from swamps and stagnant water, with excellent natural drainage by the Wallkill River and its tributary brooks." The summer of 1880 was marked by the reappearance of the chills and fever over nearly the whole of Orange county, referred to above, and parts of the adjoining ones of Ulster and Sullivan. The inhabitants of that old-settled, hilly-faced country, where the natural drainage is superb, and there is almost nothing to drain artificially, are as well acquainted with ague as ever Michigan people were in our State's most malarious days.

How can we account for such a fact as this? Whatever theory we may adopt to explain this presence of malaria in a place where theoretically it ought not to be, one fact stands prominently out, which is that Orange county is almost bare of trees, the woodland probably not being more than five per cent of the total surface of the country. The conviction is almost irresistible that the lack of timber is connected with the spread of the disease. It will not be urged that it is its cause. It will be understood that farther up, the Wallkill is bordered on one side with submerged flats, called by the inhabitants the "drowned lands." If these drowned lands are the nidus of the malarial poison, then we must extend our provisional estimate of five miles as the distance to which the wind will blow malaria, and say thirty or forty where there are no trees in the way.

The theory that refers the origin of the malaria to the drinking-water is not very tenable, as this is of excellent quality, the wells being generally sunk in the slate rock, and free from surface drainage. Admitting that the ague poison is in the drinking water, it is because it drops in from the atmosphere and circulates in the underground currents. If the country around the nidus of the poison were wooded this could not happen, neither could the winds blow it twenty-five or thirty miles if the country were generally well wooded.

A few words on methods will bring this paper to a close. What fractional part of a country should be forest to insure the best results, in health, comfort, and production? Not less than 20 per cent, probably 25 per cent; southern Michigan is passing that limit, and the consequences begin to be felt.

To effectually decide this question and make it a part of science, there must be an an accurate collection of statistics made in every country of the amount, kind and distribution of the woodland, and another equally accurate of the amount, kind and distribution of the sickness and death. Collation of these statistics, care being taken to eliminate all sources of error, would give the true answer to this question and, besides, the relation between diseases and woodland. A screen of trees should be left to the west and south of every house, in the country at least, to filter the malarial poison out of the atmosphere. The trees need not be of the largest size but of thick growth of foliage. The best kind to plant is a subject for inquiry.

The above remarks apply to some of the more direct and obvious relations of trees to health; others exist more indirect indeed, but not the less meriting attention, which for lack of space can barely be mentioned here, a small volume being needed for their full consideration.

Reference has already been made to the influence of forests on climate. Few meteorologists will dispute the statement that with the disappearance of the forests the rainfall of a country diminishes, and all are agreed that the force of the winds increases. The climate becomes less equable, being hotter in summer and colder in winter, with greater liability to sudden and extreme changes at all seasons. Fierce droughts are followed by storms of overwhelming violence, and cyclones and tornadoes destroy the product of years of toil. As these processes go on their reactions upon the public health are many and intricate. The exposures to cold and heat produce their ill results on the strongest constitutions and kill the feeble. The increased rigor of the winter season and the sudden changes of temperature make the mortality rate high among the aged and the very young. Inflammation of the lungs, pleurisy, rheumatism, and the like, are more frequent and fatal. Contagious diseases are unfavorably modified by inclement winters. In order to maintain a comfortable warmth in the house, especially in the habitations of the poor, every breath of wind being sedulously shut out, the toxic agent of the disease, whatever it may be, aided by the animal extractive matters which are fatal poisons themselves, intensify their malignancy almost beyond belief. During the epidemic of small-pox at Philadelphia a few years since the death-rate was inversely as the mean temperature. So it always is with the contagious diseases. When the house can be opened to let in the air and sun the poison flies out and is killed by the sunlight or the ozone of the atmosphere. The parching of the crops in the summer and their freezing out in the winter diminishes production, while the necessary labor to produce returns is increased, and poverty creeps in with all its attendant hardships, want of the comforts of life, and liabilities to disease. Where irrigation is not possible agriculture dies out, population diminishes, the arts and sciences suffer, and civilization goes backward. Then comes the danger of famines every few years, followed in turn by pestilences.

Such must be the fate of countries that ruthlessly destroy their forests. It is admitted that there are exceptions to this, but they do not invalidate the larger fact. Where there is mining wealth a scanty population can be supported by this industry; maritime countries can get precarious subsistence from the sea; where there is water or other power unproductive districts can support a large population; but these industries could not exist unless somewhere else there were communities that were employed in raising the breadstuffs, the meat, and textile fibres that feed and clothe the tribes of men. Agriculture is the basis of all industries, and woodland is the basis of agriculture. So, too, it can be said with truth that agriculture is the basis of the health of the human race. Mining and manufacturing would soon deteriorate and run the species out if exclusively followed. So would the large cities if not recruited by the redder blood from the fields. It is the agricultural class and the closely connected trades that keep the standard of human health and size up to its present limit.

The foregoing considerations do not give the complete signification of forests to the human family It has been said iron is the basis of civilization. This is not quite true, since there have been imperfect civilizations without it, but is true for all in which modern civilzation surpasses its predecessors. Iron is the essential in the progress that has been made since the age of bronze. If iron is the basis of civilization wood is the basis of human existence. Men lived on the earth for ages before they learned the use of any metal, but who can imagine a time that men could have lived at all without wood? Far back of the period when they hunted their game with their bows and arrows was a more primitive time when their only means of defense and securing their food was a bare club of wood. Man is naturally an arboreal animal. The woods were his birth-place and home, and from them he obtained food and clothing; and his dependence on them still, though less obvious, is no less real than it was in those earliest times. It is probable that man was then a very healthy animal with strong bones and muscles and unimpaired digestion, that enabled him to enjoy his uncooked food with greedy pleasure. After he began to separate from his sylvan associations and cut away the forest that sheltered him in his infancy, his punishment soon came in the diseases to which he has ever since been subject. We must return to nature and first principles and leave behind us the aggregated load of diseases which has so long weighed down our race.

The subject has been very inadequately treated in this little paper. There is great need that somewhat should be done with reference to it and the placing of the treatment of our forests on a scientific basis.

It cannot be expected that any such action will be taken till information concerning the primary and indispensable necessity of woodland to the welfare of a country is more widely diffused in the community, and in the interval we can only expect that the destruction will go on with its present rapidity and with its inexorable evil consequences to the comfort and health of the people of our State.

Let these crude and very elementary remarks be excused by the engrossing interest of the topic, and regarded as the first warning note of the dangers that await us as the just reward of ingratitude if we "go back" on our best friends, the forests.

Prof. Kedzie, upon request, gave a description of a visit to the stockyards and slaughtering-houses of Chicago, in the course of which he stated that bruised meats which could not be sold in the side were sold and used as canned meat.

Under the head of "Volunteer Papers," J. J. Mulheron, M. D., editor of the Michigan Medical News, of Detroit, read a short paper on "Disinfectants."

NEED OF A BOARD OF HEALTH IN DETROIT.

The following preamble and resolution was offered by I. N. Smith, M. D., of Saginaw City, and adopted:

WHEREAS, The city of Detroit occupies the position from its size and location of the metropolitan city of Michigan, and is in constant communication with all portions of the State,

Resolved, That it is the sense of this convention, that the interests of the health of the State require that an intelligent supervision of contagious diseases and their origin and source be instituted and established in the city of Detroit;

Resolved, That we regard the position of Detroit in this matter as quite exceptional not only to that of all other large cities, but also to all the other cities of Michigan.

ADULTERATION OF FOODS AND DRUGS.

Hon. LeRoy Parker, of Flint, offered the following resolution which was adopted:

Resolved, That this convention endorse the memorial of the National Board of Trade, recommending to Congress the passage of a bill for the prevention of the adulteration of food or drugs, and that the Secretary of this convention be directed to send a copy of this resolution to our senators and representatives in Congress, requesting them to use their influence in securing the passage of the bill recommended by the National Board of Trade or some similar bill.

Dr. Taylor, of the U. S. Army, being called on, made some valuable, practical remarks on sanitary subjects, which called forth a vote of thanks from the convention, after which the convention adjourned.

FIFTH SESSION, WEDNESDAY, JAN. 26, 7 P. M.

The reading of the minutes of the two previous sessions was dispensed with.

REPORTS OF COMMITTEES.

REPORT OF COMMITTEE ON VENTILATION.

To the President and Members of the Sanitary Convention:—Your committee on ventilating appliances respectfully report that it has examined the only appliance submitted to it,—which was the "Scott Nonesuch Chimney Cap and Ventilator," and your committee find that it has merits in the direction claimed for it,—namely, in the prevention of downward currents of air in chimneys.

HENRY B. BAKER,
JOHN S. CAULKINS.

REPORT OF THE COMMITTEE ON SEWERAGE-APPLIANCES.

The committee on sewerage apparatus beg leave respectfully to report that they have examined the ventilating arrangements exhibited by Mr. J. B. Atwood of this city, and are of the opinion that they are well adapted for the purpose designed in obviating the defects of the ordinary sewer-trap.

Respectfully submitted,

D. CLARKE,
H. C. FAIRBANK.

REPORT OF THE COMMITTEE ON RESOLUTIONS.

WHEREAS, A knowledge of the laws of Sanitary Science, or the prevention of disease, is universally admitted in theory, but unfortunately almost as universally neglected in practice; therefore be it

Resolved, That the thanks of this convention are eminently due to the State Board of Health, in both its corporate and its individual capacities, for their unremitting praiseworthy efforts to bring these vitally important matters home to the hearthstones of the public by every expedient in their power, and especially this method of holding public conventions in various parts of our State;

Resolved, That this meeting, in arousing public attention to the preservation of health, by the employment of hygienic measures, will doubtless be of great importance to this community, and a proper report of the admirable papers presented, addresses delivered, and discussions had thereon, of this and similar conventions will be of incalculable benefit to the country at large, and, that the knowledge may be fully diffused and disseminated throughout the State, the legislature is respectfully urged to make a sufficient appropriation to meet the expense of printing, and sowing broadcast such papers and addresses as in the judgment of the State Board of Health may be considered expedient.

Resolved, That the thanks of this community are due to the local committee, mayor of the city, and officers of this convention for their painstaking labors and efforts by which we have had secured to us this opportunity of listening to the elaborate disquisitions read, and learned discussions had, in these very successful meetings.

Resolved, That our thanks are especially due to those who so generously prepared and read those excellent papers, which contributed so much to the success of this convention.

Resolved, That our cordial thanks are hereby tendered to the press for publishing reports of the proceedings, which furnishes but another example of the readiness with which it supports every laudable enterprise.

A. A. Thompson,
T. R. Buckham.

The report of the committee was adopted.

REPORT OF THE COMMITTEE ON SANITARY PUBLICATIONS.

On the exhibit made by the State Board of Health, and by Jno. K. Allen, of Lansing.

The object of appointing a committee on periodicals is supposed to be to suggest means by which the publications of your Board, and other treatises connected with sanitary science, may have the best circulation.

That the people must be informed and influenced very much through the press, need not be argued.

Your committee respectfully submit the following suggestions:

1st. That papers of interest to the public generally, or to special classes, should be issued in pamphlet form, separate from the annual volume and the reports of the convention.

2d. That such papers and the volumes of the Board should be brought to the notice of persons who from their positions can reach large classes, as county and town officials, teachers, clergymen, etc.

3d. That attention should be drawn to the tracts published by the "Ladies' Sanitary Association of London," on exhibition at this meeting, as admirably adapted to circulation among all classes, and worthy of being read in schools, women's meetings, etc.

4th. That volumes on sanitary science should be placed in public libraries.

5th. Your committee would renew the recommendation made in the report on publications submitted last year to the convention at Grand Rapids, "the establishment of a health column in the press of each place where a journal is published in which the board of health shall condense all valuable knowledge on this subject, and that persons capable of writing suitable articles on sanitary subjects should be encouraged to publish them in the press of their own vicinity.

6th. Your committee commend the prudence and attention that have issued some of the more important publications in foreign tongues.

Geo. D. Gillespie,
D. C. Jacokes.

Prof. Kedzie, of the committee on disinfectants, requested time to make a more extended examination of the disinfectants on exhibition by D. O. Haynes, from Parke, Davis & Co., of Detroit. No formal report has been received.

REPORT ON THE DIPHTHERIA IN THE MICHIGAN INSTITUTION FOR THE EDUCATION OF THE DEAF AND DUMB.

BY D. CLARKE, M. D.

Sore throat in its various forms is a common ailment among the pupils, many of whom suffer from enlarged tonsils, which are scarred and ragged, showing the effects of former disease. Many such cases, presenting various phases of inflammation, have required treatment during the fall, but no case of diphtheria was encountered until the latter part of November. On the 23d of that month, 1880, my attention was called to Fannie Young, aged 12, who had been suddenly and violently attacked during the night previous. I found her suffering severely from inflammation of the throat, which was much enlarged externally. On examination I found both tonsils much swollen and highly inflamed, with a diphtheritic deposit on the under sides and covering the pharynx beyond. This proved to be a very severe case and had a narrow escape from a fatal result; but made a speedy and satisfactory recovery. November 24 the case of Alice Penny was reported, but it subsequently transpired that she was taken at the same time with the first case, but had avoided reporting herself lest she might be debarred from the approaching Thanksgiving festivities. This was a much milder case than the first, and was attended with a copious eruption resembling scarlatina. Both these subjects slept in the same dormitory, but in different compartments. Three boys, each aged 12, were taken down the same day. These were all mild cases and had no eruption, but subsequently one of them had a relapse and was seriously sick. No other cases occurred until the 28th, when Alice Hauser, aged 11, was taken down. This was a case of great severity. She had a fragile constitution, and after convalescing had a relapse and was confined to her bed 41 days, a much longer period than any one else. Another girl, aged 16, came down on the same day, and two other girls, aged 12 and 13, on the succeeding day. These all made good recoveries. On the occurrence of the first case prompt measures were taken by isolation and establishing a strict quarantine to prevent the spread of the disease. The effort was made with more confidence, as that course had been successful in a case the season previous of a boy who had just come from home where diphtheria was in the family, one child having died. Although he had the disease severely and was alarmingly sick for several days with a low type of fever accompanied with delirium, he made a good recovery, and no other case occurred at that time. These nine cases which occurred in November, slept in four different dormitories, and were from seven different school-rooms, so that no center or fountain-head of the disease could be discovered, nor could any existing cause be detected in or about the buildings. The same rigid system of isolation was kept up, but to no effect, as after a respite of three days, the disease broke out with renewed violence, new cases occurring as follows: December 3, 11; Dec. 4, 26; Dec. 5, 7; Dec. 8, 12; Dec. 9, 6; Dec. 10, 4,—when the violence of the storm abated, subsequent cases coming on at intervals of two or three days. This sudden increase of patients filled the hospitals to overflowing, and it became necessary to use a dormitory and several other rooms for that purpose; and also to classify the patients in order to secure prompt and regular treatment, the more severe cases being placed by themselves where they could receive special treatment and that vigilant care which is so essential in this disease. The milder cases and the convalescents were individually inspected twice a day, those that required it being sent for special treatment, and others who had recovered being discharged to the convalescent rooms from day to day, all being regularly treated with tonics until the recovery was complete and strength reëstablished.

The cases varied much in severity, and in their character and course. The type of the severe cases was similar, being characterized by severe inflammation of the throat, although varying in the extent of the diphtheritic deposit. The fever, which was often very high at the commencement, soon took a low type, the change being often sudden and unexpected, with a rapid and feeble pulse, notwithstanding tonics were given freely from the first.

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This stage was attended with delirium and the disposition to pick and reach for imaginary objects, vitality was low and the response tardy, even under the free use of stimulants and special nourishment, as milk-punch, beef-tea, etc. Another marked feature of many cases was cerebro-spinal irritation with a disposition to throw the head back, attended with great nervous irritability and with a tendency to convulsions, which occurred in one case. One of the most satisfactory indications of approaching convalescence in these cases was the relaxation of this dorsal tension, with a return of the head to a normal position. Some cases were attended with a cutaneous eruption varying much in its character, sometimes resembling scarlatina, at others mixed with papillæ, sometimes resembling measles, and at others blotched like urticaria or flushed like erythema. These various eruptions were attended with itching and followed with a desquamation of the cuticle [scaling or peeling of the skin], but there was no constant connection between the state of the skin and the condition of the throat, the two being combined in some severe cases, while many of the severest cases and a majority of all the cases showed no eruption of the skin. Hemorrhages occurred in some cases from the nose and fauces, and some had hemorrhagic discharges from the kidneys. The sequelæ in some cases were rheumatic pains with swelling of the limbs. In some cases this affection of the throat was the principal indication of disease, while in others it was a secondary affair, not showing itself until after the constitutional symptoms were developed. Many cases were mild and readily gave way to treatment, while others were very severe, requiring constant, vigilant attention, as the changes often came suddenly and unexpectedly, the cases varying much in their course and in the development of the different stages, with peculiar complications in many. On this account too much credit cannot be given to the matron, Miss Hill, and her assistant, Miss Austin, for the untiring devotion and judicious care which they gave. But for that vigilance and care I am confident that the record of this epidemic would not have been without a single death. The commendation should also extend to the supervisors, Mrs. Jones and Mr. Newcomb, who, in addition to their other duties, rendered invaluable service by their watchful vigilance. Nor should the faithful services of the other attendants be overlooked, who cheerfully bore the additional burden thrown upon them by this dislocation of the domestic arrangements.

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NOTE.—When this report was read at the meeting of the convention, it was received, at least by the medical profession, with apparent incredulity. While the immunity from fatal results was not denied, that immunity was taken as evidence that there was some mistake; that the disease could not be diphtheria, but scarlatina, common sore throat, pseudo-diphtheria, or something else. A corroboration of this view was sought in the fact that no microscopic examination or chemical analysis of the membranous deposit had been made. I think that a careful reading of the report will show that no attempt was made at special pleading, but that all the facts were impartially presented. Many things, especially in the sequelæ of some cases, showed strong affinities with scarlatina, while others and a large majority of the cases showed more exclusive indications of diphtheria,—in fact there was that blending of the two diseases, or two forms of disease, which is constantly met with in ordinary practice. Cases have occurred in this city which physicians of unquestioned ability and professional reputations, have pronounced were not diphtheria, but which on proving fatal have been reported in the mortuary statistics under the heading "Diphtheria." It is doubtful whether there are many physicians of experience who will give a categorical answer in every case whether it is diphtheria or not at the outset. Observation confirms the remark that all medical nomenclature is but proximate and provisional, and that we do not find in nature the broad distinction which we find in books, where the lines are well defined by taking the extreme cases of each disease; but, on the contrary, we find a blending as in the prismatic colors, while often the umbra and adumbra exceeds the nucleus. I will present the following case as illustrative of this point. May 6, 1881, I was called upon by Mr. S. Hall, living about four miles from this city, to visit his daughter. He stated that there had been a "rash" in his neighborhood; that his daughter, after attending school two days (May 1st and 2d), was taken sick, and was thought to be coming down with the "rash," but on that morning (6th) she complained of sore throat, and he feared it might be diphtheria, as it proved to be, being developed on both tonsils. As it appeared to be a mild and manageable case, a prescription was made and instructions given that if the case did not progress favorably I should be informed. Nothing further was heard from it until Monday (May 9th), when the mother called, reported the case better, but wanted medicine for another daughter. The next morning (10th), at day-break, the father called, being very much alarmed, and expressed the opinion that the daughter first taken would not be alive when we reached his house. It transpired that the patient's reluctance to use remedies had been yielded to, and she was now in a desperate condition, pulse feeble and rapid and the respiration labored and croupy. By energetic and persevering use of remedial means she was relieved, and both recovered. There were two women assisting in the family, Mrs. T., a neighbor, and Mrs. O., a sister of Mr. H. Some days after a child of Mrs. T. died of what our medical health officer pronounced to be diphtheria, and Mr. H. was severely censured for not placarding his premises. May 30 I was again called upon by Mr. H. with a request to visit the family of his sister, Mrs. O., two of her children having been sick for several days with diphtheria. I found both to be severe cases—one of them beyond any reasonable hope of relief. In consequence of their refusal to submit to treatment, they were left to nature and both died. The origin of these three fatal cases could be traced directly to Hall's family, and if they were not all five cases of diphtheria, then I must confess that I have never seen a case of diphtheria,—and if these were cases of diphtheria, I am equally confident that the disease at the Institution was diphtheria. As to the criticism that the microscopic and chemical laboratory were not called into requisition to establish the diagnosis, I can only say that it was not done in these cases, neither do I think that it is often resorted to by practical men; certainly our time, attention and energies were too severely taxed to admit of any such elaborate investigation had there been any doubt in the diagnosis while the thought could be entertained by none, but that abundant proof would be forthcoming if fatality was to be taken as the criterion of diphtheria; for it can be truly said that those in the Institution were no less surprised than those outside at the happy outcome from the terrible visitation. For my own part, I repeat the disclaimer already given, of any assumption of superior skill in treating diphtheria or any other disease, and have no doubt but that others under the same circumstances would have had the same result.

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D. CLARKE.

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* [In this paper, and note, the "* * *" indicate omissions of description of and comments on medical treatment,—a subject not necessarily included in this volume, which deals with the causation, restriction and prevention of sickness, but not with therapeutics.—H. B. B., Sec. S. B. of H.]

Henry B. Baker, M. D., Secretary of the State Board of Health, being called on for a statement of the statistics relative to the age of persons who die of diphtheria, made such a statement, as follows:—

The statistics of deaths in Massachusetts for the 17 years ending with 1879, show that of the 16,279 persons who died from diphtheria, more than 8,000 were children under five years of age; more than 4,000 were children between the ages of five and ten years. It will be seen that more than three-fourths, really more than eight-tenths (83.11 per cent) of all the deaths were of children under ten years of age.

These facts seem to be of very great importance to be borne in mind by all who study the disease and make efforts for its restriction; they should also be acknowledged by physicians and all others who report or study cases and proportion of deaths from diphtheria. Among persons over ten years of age, very few deaths should be expected, while among children under five years of age, the death-rate may be expected to be large.

DISCUSSION.

While the report of Dr. Clarke was under discussion,

Dr. Jerome said that without any purpose or desire to antagonize Dr. Clark in any offensive way, relative to his report of diphtheria at the Asylum, yet, understanding as he did, that he had treated there 113 cases, all of which got well, being so much at variance with the experience of all other physicians who had furnished the world with results in their own practice, as to challenge its correctness,* and especially so when the treatment given was similar to that employed by all physicians in the treatment of this disease, but with far different results.

It was known to all physicians actively engaged in practice, that during the prevalence of any epidemic form of disease, that all ailments occurring at that time partook more or less of the character of the prevailing epidemic, requiring such preventive agencies as prudence would suggest.

That during the present prevalence of diphtheria, much of follicular inflammation had been discoverable in the throats of children which did not result in the full development of the diphtheria, and as we understand Dr. Clark to say, that no disturbance of the larynx occurred, no croup symptoms in any of them, adds to the presumption of an error in diagnosis. We are of the opinion that an organization like the present should be guarded in their acceptance or tacit endorsement of a report coming from any one individual, so antagonistic to the experience of all others, the influence of which would be to disparage the practice of other skillful men.

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*[It seems important to remember in this connection the facts, mentioned above, relative to the age of persons who die of diphtheria; also the facts as to the age of inmates of the Asylum for the Deaf and Dumb. The rules for admission to the Asylum provide that only those over ten years of age shall be admitted. I was informed that very few were admitted under that age. Very few if any deaths should, therefore, result from an outbreak of diphtheria among such inmates. Some physicians "who have furnished the world with results in their own practice" have apparently often overlooked the many mild cases occuring among adults (for most of which no physician is called, and which are often not recognized as diphtheria), and thus have not recognized the much greater fatality of diphtheria among children than among adults.—Henry B. Baker, Sec. S. B. of H.]

Dr. Cogshall offered the following resolution which was unanimously adopted:

Resolved, That the thanks of this convention are due and are hereby tendered to Dr. MacIntyre Principal of the Deaf and Dumb Institute, and his co-laborers, for the kind invitation to visit the said institution, and witness their mode of instructing this unfortunate class, and for their princely hospitality while there, and we express the hope that he may long be spared to minister to the wants and necessities of the wards of our beloved State.

The first paper of the evening was a report of the Grand Rapids Sanitary Association, presented by the Rt. Rev. Geo. D. Gillespie, of Grand Rapids, President of the Association, who stated that this report had been prepared in great part by C. H. Maxim, M. D., Secretary of the Association.

REPORT OF THE GRAND RAPIDS SANITARY ASSOCIATION.*

BY THE RT. REV. GEO. D. GILLESPIE, PRESIDENT, AND C. H. MAXIM, M. D., SECRETARY, OF THE GRAND RAPIDS SANITARY ASSOCIATION.

The Grand Rapids Sanitary Association dates its existence from June 23, 1880, but the influences which conduced to its organization have a date going far back of that. Many of our citizens who had eyes to see the unsanitary condition of parts of our city, had been thinking and pondering for a long time. And, indeed, the truth must be owned that there were many things to set men of observation to studying regarding some radical change in the direction of greater cleanliness. It is a fact that during the warmer months of the last eight or ten years, no one, whose olfactory nerves were in a healthy state, could walk certain streets and alleys by day or by night, without being reminded of the process of disintegration and decay.

Men began to think whether there might not be some connection as cause and effect between the condition of these streets and alleys and our too large death-rate. They began to realize that the sombre hearse with its sad and solemn following traversed our streets with too great frequency—that diphtheria and scarlet fever and typhoid fever, with diseases of kindred type, were too often piloting the grim messenger to our happy, peaceful homes.

In short, men who stopped to think saw most unmistakably that the percentage of sickness and death was too large when compared with the size of our city and its natural sanitary advantages.

But let not other cities of the Peninsula State lay the sweet unction to their souls that they are better than we are in a sanitary sense. I do not believe it. I believe that the one crying sin of our Michigan cities and towns is their utter want of good sanitary regulations of cleanliness. Grand Rapids is no worse, as she is no better, than her sisters in this regard. It would be very hard indeed to find a city with so many natural advantages for maintaining good sanitary and hygienic conditions as we possess here. Situated in a narrow valley gently sloping to the south, with high bluffs on either side, a dry, sandy soil for the most part, and a large and rapid river flowing with a free current through its entire extent, it would be hard to plan a location with greater advantages for drainage and consequent cleanliness than we have here.

As I have said, men began to inquire into these things and to look about them. They could not help seeing what nature had done for the city by making a wide, open sewer in the form of a noble river running through its center, and giving a gentle incline to the land toward that river in all directions; so that it should be an easy problem to solve as to the construction of a system of sewers that should effectually drain the city and render it clean and wholesome.

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*[The constitution of the Grand Rapids Sanitary Association is printed on pages lxxxv-lxxxvi of the Report of the State Board of Health for 1880.]

But when men got the cobwebs of ignorance out of their eyes, when they began to look about and inquire into things what did they find? They found sewers enough to be sure, but constructed upon a plan which was anything but scientific. They found plenty of sewers that did not, and that could not, do the work for which they were intended, until nature's laws can be set aside. They found sewers, under prominent residence and business streets, where the amount of drainage they ought to carry off is immense, entirely filled up, so that even the slimy rats themselves could not get through them; for years had they been in that condition, and the filth, and slops, and disease-breeding refuse, from hundreds of houses and out-buildings had to be left on the surface of the ground to fester and poison the atmosphere. They found streets and alleys, in the very heart of the city, filled with rotting vegetable and animal *debris*. They found cess-pools and privy vaults, in all parts of the city fairly running over with rottenness. All these things they found and much more of a like sickening nature, and they no longer wondered that the death-rate was almost up to that of New York and even London.

Seeing this condition of things, they began to ask what could be done to change it; where was the remedy? When, in any direction, reform is needed, it has been found by experience that individual effort is of little avail, but that men must go to work by organized effort. In religion men work through organized churches; in politics through organized parties; in temperance through organized lodges; in education through organized schools, and so on through the entire catalogue of reforms. Acting on this principle, these men who realized the sad sanitary condition of our city, and seeing, desired to reform it, came to the conclusion that, to act with success, they must organize for the work. A meeting was called. A few met, consulted, planned, and brought about the organization of the Grand Rapids Sanitary Association,—an organization that has already done a vast amount of good in opening the eyes of our citizens to see the unsatisfactory condition of the city, and I believe that it is an organization whose work is but just begun; that it is destined to live, grow and prosper till the good work it was created to accomplish is done, and Grand Rapids is made so cleanly and pure in all sanitary aspects that she may be held up as a model for other towns to imitate; that her citizens may show her condition to visitors and strangers with a just and commendable pride. As a rule, since the Association was organized, meetings have been held every two weeks, and at almost every meeting some one or more able and valuable papers on sanitary topics have been read, and interesting and profitable discussions have been had. While the attendance at these meetings has not been as full as has been desirable, still, on the whole, it has been fair considering the utter lack of interest that the general public has had in the objects for which the meetings have been held. But an encouraging feature of our meetings has been, that those who have attended have been men who came for a purpose; men who were in earnest in the work and who meant business. Some of our ablest minds among the clergy and other professions, as well as men who have always had a prominent place in the city's history, have identified themselves with the Association, and have taken hold with an energy and determination that is an earnest of success. It is to be most earnestly hoped that scores of other earnest men, seeing the good works of these, and imitating their example, "will go and do likewise." The city papers, too, with few exceptions, have done nobly, and where all have done good work it may seem like partiality to specify any single one; still, I cannot forbear mentioning the earnest work done and the advanced position taken by the Eagle. The special work for which the Association was organized was to create a more healthy public opinion, and in such a work there is no agent more efficient, more powerful, than is the press; and it is to be hoped that the press of our city will redouble its efforts in that direction in the future.

The formation of this Association was, in the minds of many, a doubtful experiment, and there were not a few who foretold for it a short and uneventful existence; but, in taking a backward glance and viewing the work already done, there surely seems to be no cause for discouragement, but many reasons are seen to prompt us to be hopeful and to renew our efforts in the cause of sanitary reform in our city. One great good that has been done by the organization is the effect it has had upon our local board of health and the city council. The members of those bodies, seeing so many of our influential citizens waking up to the need of sanitary reform, have been encouraged to more earnest work and a more liberal spirit. If nothing more than this had resulted from the formation of the Association it would have well repaid the effort, but much more than this has been accomplished. Good seed has been sown which is sure to germinate and grow, eventually ripening into a rich harvest of health and happiness.

Before closing, I would not fail to mention the good which has resulted to this city and vicinity from the Sanitary Convention held here a year ago. In fact it was mainly that convention and the influences emanating from it, which were largely instrumental in so moulding opinions as to result in the formation of our Sanitary Association; and it is to be hoped that these conventions will be continued till all our cities and large towns have received their benefits, and further, that they will be instrumental in the formation of a permanent Sanitary Association at every place where they convene.

Appended is a list of papers which have been read before the Association, with the subject of each and the name of the author.

C. H. MAXIM, M. D., *Secretary.*

LIST OF PAPERS READ BEFORE THE GRAND RAPIDS SANITARY ASSOCIATION.

On Contagious Diseases.—Dr. Wm. Fuller.
On Sewer Gas.—Dr. M. Veenboer.
On Defective Sewers and Drains.—W. C. Weatherly.
On Clark's Method of Purifying Drinking-Water, first and second paper, Hugo Thum, M. D.
On Defects in Sewers.—Dr. G B. Miller,
On Fulton St. Cemetery.—Dr. R. H. Stevens.
On Analysis of Grand Rapids Water-Supply.—Hugo Thum, M. D.
History of Grand Rapids Water-Supply.—Rev. J. Morgan Smith.
Adulterations of Milk.—Dr. R. H. Stevens.
On the Best Methods of Cleaning our Premises.—Rev. J. Morgan Smith.

DISCUSSION.

The report was discussed by Drs. Cogshall and Kedzie.

The next number of the program was a verbal address on "Pure Air in our Dwellings," by Rev. D. C. Jacokes, D. D., of Pontiac, member of the State Board of Health, and its committee on ventilation. The address was practical and was listened to with deep interest by the large audience.

Following this was the last paper of the convention, on the subject of public school work in its relation to the health of pupils, by Prof. M. T. Gass, Superintendent of the Flint Public Schools. The paper is as follows:

IS THE GRADE-WORK OF OUR PUBLIC SCHOOLS IN ITS NATURE AND REQUIREMENTS DETRIMENTAL TO THE HEALTH OF PUPILS?

BY PROF. M. T. GASS, OF FLINT, MICHIGAN.

In presenting this subject, a solution is sought to a *question* in the mouths of very many, and an answer to what has been very likely a query in the minds of us all.

The desirability and perhaps necessity of opening the question here, exists, I think, not in the fact that there are results of over-work in our schools so serious as to be an evil crying for correction at our hands, but in the prevalence of false notions of such results; and that the minds of those thus deluded, if so they be, may be set aright and made acquainted with the true nature and facts of the case, by those who are deemed competent to give reliable information in reference thereto.

I do not propose in the little time that I shall take to open the question, to go into a scientific or exhaustive discussion of its merits, leaving this to the scientific men present, but to simply call your attention to a few of the many cases that are constantly arising in the experiences of almost every teacher, which will illustrate well how such notions arise, the extent to which they prevail, and why, and how little they are entitled to the credulity they receive from those who entertain them.

I desire, further, to leave out of consideration the unfavorable circumstances and physical conditions, under which pupils are compelled to perform their duties, as this would be beyond the limits of the question, and direct your attention to the work only required in the school-room, and its probable effect upon the health of the child.

It is a fact that there are very frequent cases of ill health among pupils, the causes of which have been charged to over-work in the school-room. These charges have been made, no doubt, in some instances, in good faith; and almost invariably with no small degree of pride in the fact that the fond mother has found in her boy a martyr to so noble a cause; possessed of so commendable an ambition, to which he is a willing victim sacrificing his very life. It is a flattering, comforting thought, and so much so that no effort is made to seek further for what may be the true cause of the ills which have shown themselves, and the sweeping charge is made that the system of education is radically wrong, the course of study excessive in its requirements, teachers oppressive in the tasks assigned, and everybody and all things connected with the work condemned, and a demand made that the entire system be changed or modified.

I have thought sometimes that physicians themselves for the sake of favor among their patrons, if they did not encourage, at least allowed the notion to prevail that their childish patients were suffering from a too close application to study, when a more careful diagnosis of the cases, and consideration of the circumstances bearing upon them, would reveal a widely different and much more prolific source of human ill.

It is now but a few weeks since I was interviewed by a mother in reference to the declining health of her boy; suffering, as she seemed to think and as was charged by her family physician, from the miserably oppressive and over-taxing work that he was required to perform in his school duties. Being a little reluctant to accept the theory, I investigated further to satisfy myself in regard to the case of the boy, and learned from the mother herself, before the interview had closed, that the primary cause of difficulty was an injury that the boy received at the hands of his playmates in their sports upon the school grounds a year or more previous, and that his present suffering was only a reappearance of his former trouble.

The case cited is only one of scores like it which are constantly arising in the experiences of those who are engaged in the work of teaching, and cases, too, for which teachers feel that they are obliged often times to suffer an unjust as well as an embarrassing responsibility. They are made to feel frequently that they are looked upon only as a set of taskmasters, tyrannical and unyielding, without feeling or sympathy for those under their instruction, crowding them in their work to their utmost capacity, without reference to the strain upon their tender intellects or their yielding powers of physical endurance.

I think I hardly need to take the time here in trying to show to you that teachers are not so different from other people that they are devoid of the feeling which prompts a sanitary interest in their pupils. A journey through the grades of the various departments in our public schools and an observance of the attention given to the welfare and comfort of the children,—as regards temperature, where it is regulated by a close watch of the best thermometers; as respects cleanliness, where the children are provided with the facilities for ablutions, and in many instances required to take them before beginning their daily work; as regards study and recreation, where the teacher is, especially in the lower grades, constantly alternating one with the other, carefully bundling pupils for their out-door exercises and attending to their comforts as they return,—an observance of all these things, I think, would serve well to convince one that their sanitary wants and physical comforts were quite as well, and in many instances better looked after in school than at home. But this is a digression from the main subject only for a defense of the profession against an unkind and unjust attack.

Now, in the work the child is required to perform in his daily routine of duties, in order to make the grades in the time allotted, is wherein I have apprehended in the conception of this question, and as a matter of experience know, our schools are severely criticised; and whether justly or not is the point upon which we wish to seek light.

It may be laid down as a cardinal principle upon which all public school work should proceed, that it should afford the greatest good to the greatest number; that it should be arranged to correspond to the *average* ability of those who are to perform it; that in its provisions and requirements it should be adapted to the *normal* condition of pupils as a whole.

To place before the mass of pupils a course of work arranged with reference to the ability of mental experts and prodigies would be an evident injustice to those less favorably endowed. To provide a course commensurate with the capacity of dullards and drones only, or suited to the indifference of those who have an apathy for school work, would be depriving a majority of pupils of the mental pabulum necessary to a healthy growth of mind, and as evidently unjust as the other extreme. The work then must be provided and arranged for the pupil of average mind, and so long as children of brilliant, ordinary or inefficient minds are born and reared, we may expect that any such system of work will be attacked and criticised from both sides, as failing to give sufficient employment to some, while others are taxed beyond their powers of endurance,—a criticism that argues the propriety and justice of the system rather than its deficiency or excessiveness.

The courses of study now pursued in most of our public schools are in their general features quite uniform, and involve the principles and ends already stated. They are the results of years of labor and experience on the part of the best educators of the country; men who have spent their whole lives in studying the best means of educating and training the minds of the young, and have formulated their ideas in these courses with reference thereto. That they are imperfect and may be in many respects improved, no one, I think, will deny; but that they are so excessive in their requirements and exacting in their demands upon the strength and ability of pupils as a whole, doubtless very few, if any, who are familiar or experienced in the work, will admit. It is designed that the work of a grade in our schools shall be the work of a year, and in the most of them the course embraces twelve grades, and consequently twelve years are occupied in completing them. In order to ascertain whether pupils did perform the work in the time allotted, or whether they were behind or in advance of their years in their grade-work, I have made a careful computation of the average ages of pupils in our city schools from the first to the eighth grades inclusive, and found them to be as follows: In the first grade or at the time of entering, their average ages are seven years and one month; omitting the intermediate grades, I find them in the eighth grade to be fourteen years and six months, showing the time occupied for completing the work of the first seven grades, seven years and five months. But in the computation are embraced very many foreign pupils whose ages are from fourteen to twenty years, and others who have not been regularly in the grade work. Such pupils would tend to increase these averages as the grades advance, and should, since they have not followed the course, be left out of the reckoning. Deducting one-half year, a safe estimate of the increase in the average occasioned by reckoning these pupils, and it leaves thirteen years and eleven months as the average age of pupils in the eighth grade who have followed the course marked out, and six years and ten months as the time occupied in doing seven years' work. This, it seems to me, is quite a satisfactory answer to the charge that our school work is beyond the strength of pupils who attempt it.

I think, too, the amount of time actually spent by pupils upon their studies while in school, is generally over-estimated by those who have not given it close attention. The school sessions in most of our graded schools are two; that of the morning, three hours in length, and that of the afternoon, two and one-half hours. Deducting one-half hour for recesses, it leaves five hours as the exact length of the two sessions.

During one-half of this time the pupils are engaged in recitations, which is spent by the individual pupil mostly in listening to the work of teacher or classmate. This leaves two and one-half hours a day as the time to *be* devoted to study. Now all, doubtless, who have had any experience in teaching will bear witness with me, that pupils as a whole do not spend to exceed two-thirds of their time in *close* application to their books. The rest of it, if not devoted to mischief, is squandered in idleness. I believe this from my best judgment to be true: if two hours per day were devoted to close, careful study, all that is required in our first eight grades might be accomplished and well done in the time set apart for it. Who is there that would ask for less? A sense of justice and economy of time on the part of pupils themselves, prompts *them* to ask for more, and it is a fact that there are many more pupils to-day in our schools who have asked to, and are taking more than is required by the course, than there are taking less, to say nothing of the scores who would be glad to do so if permission could be obtained. There may be many who break down in health during the performance of their school-work, but I cannot repress the belief that there is an over-ready, unjustifiable willingness on the part of parents to charge it wholly to so flattering a cause as the work the child is compelled to perform. In the team that draws the plow through the field, or speeds the coach over the dusty way, it is not the horse that needs urging and goading that first gives out and goes to the pasture to recruit, but the fiery, spirited, ambitious steed that drives hard upon the bit.

So, those of our pupils who suffer ill health from overwork in our school, will not be found, I think, of the many even-tempered, steady-going ones, who are willing to take things in the order they come, and in the time allotted, but of the few who are ambitious and anxious to double the work and take it in one-half the time. I venture that even these will be found to have suffered, not from the work done or required in school, but that which is performed and self-imposed outside, and for which the course of study is in no way responsible, unless it be for the (unhealthy) enthusiasm it may have created in the child, a fault which, as a rule, would be a virtue.

In the case of the boy cited, aside from the fact of having injured himself in his sports, I learned from his mother that he employed very little or none of his time at home upon his school work, but that he was a great reader and was constantly perusing books of all kinds unless prevented from so doing by his parents; yet in the opinion of his mother and physician, he was breaking down under the burden of his school duties alone. Another case I wish to cite, in point only, as showing the amount of literary work that children of tender years are allowed by their parents to perform outside of school, and that, too, when in the opinion of the parent the school work is decidedly excessive. It is the case of a girl eleven years old, doing sixth grade work, who was in the habit of bringing home from the Sabbath-school library two books every Sunday, drawing every week upon a ticket she held, two books from a ladies' library, and borrowing the two drawn by a neighbor's daughter, and reading the six through in one week. This to my certain knowledge was kept up for one whole season, and no doubt that, if the child had broken down under it, there were those who would have charged it to excessive school work as a first cause. Then there are those in school who are inefficient in body and mind, and have been from the beginning. These come and go, and try, and break down, and year after year are struggling against ill health or mental incompetency to accomplish what their more able-bodied or able-minded classmates are doing. But should a course of study be so modified as to adapt it to their crippled capacities? There may be a few of feeble health sitting at the table, but shall all therefore subsist on an invalid's diet, or shall the spread consist of hearty food that will make bone, muscle and brain, as the developing powers and strength of body and mind demand?

The course of study cannot be arranged for the invalid child, who is able to attend school only one-half the time or less, but the wants of the great mass of healthy, growing children are consulted and provided for, and because there are some who are so unfortunate as not to be able to avail themselves of the privileges offered all, is no evidence that the course is at fault in its provisions and requirements. Pupils engage in sports necessary to healthy recreation, but it would hardly be argued that they should be so modified as not to answer this purpose because there are a few too feeble to participate in them. If school-work was the only burden that taxed the strength of pupils, they would carry a much lighter load than very many of them do, and it alone might be made responsible for the results that follow. But a far different state of affairs exists with a large number in our schools. Besides trying to perform their duties there, which is all that very many of them ought to attempt, they are taking painting, and drawing, and music, and dancing, and a distracting variety of other things which engross the hours of the day, rob night of its sleep, and the body of its needed rest. Pupils come to school in the morning exhausted by the night's festivities, better subjects for the sick chamber and nurse than for the school-room and teacher. I would not ignore the importance of these accomplishments, but the point I wish to make in alluding to them is that they are crowded upon the time of pupils to that extent that they often break down under them, and their school work alone is charged with the evil results, for which these are in whole or in part responsible. But *they* are practiced under the direction or permission of parents, and to make these things responsible for the wrongs that follow would be a sort of self-crimination. Therefore, other causes are sought, and the most plausible one and the one which the pride of the parent first seeks, is the burden of school labor. There seems to be a tendency on the part of some, too, to look to the school-room as the source of nearly *all* ills, physical and moral as well. It is only a short time since that a boy of a very few summers was sent to my office by his mother, asking to be transferred to another building for the reason that he was learning bad habits from his schoolmates, chief among which was that of swearing. Not being aware that the school he attended was much worse than others in this respect, I questioned him somewhat closely. It was his first half-year in school, and I could not think that under its influences he had become so morally depraved as was represented, in so very short a time. With childish frankness he informed me that he was in the habit of swearing and had been before he had ever attended school, and he informed me further that he had heard it very frequently at home. This case is in point only as showing a quite prevalent disposition to charge to our schools wrongs in general, for which much more efficient causes exist elsewhere. There are, I will admit, elements in them that are somewhat demoralizing, and which we would all be glad to correct or eliminate, but I cannot think that they are the agents of moral depravity that some would make them.

Again, I think parents are too apt to form opinions from the childish notions that pupils carry home of their work. Either from indisposition to study or vivid imaginations, mole-hills seem to be mountains to them, and what is but an ordinary amount of work seems very burdensome particularly if done under protest, as is quite often the case.

The pitiful story of the child in regard to his trials excites the sympathy of of the parent, and frequently the belief that he is over-worked, when an inquiry into the true nature of the case would reveal the startling facts as to how little of his time was actually devoted to study, and the surprising amount of apathy he had for doing what little was really accomplished.

The cases I have called attention to are mentioned only to show a few of the many and various ways that instances of ill health arise among pupils, the false notions that prevail of their causes, and the consequent unjust censure and responsibility attached to school work. I am ready to admit that there may be instances where there is actual suffering from over school work, and many more resulting from the unfavorable circumstances under which the work is performed, as improper ventilation, poor seating, etc., but I cannot believe there is any general tendency in the nature and amount of our school work, to incite disease. From my own experience and judgment, I cannot believe otherwise than that school work by the regular habits it induces, by the mental stimulus it affords, and the love of knowledge it inspires, tells favorably upon the physical health of children; that the evils of school life are accidental rather than necessary; and that attendance upon our schools under favorable physical conditions, promotes health and longevity.

After this paper, the convention adjourned *sine die.*

BELA COGSHALL, M. D.,
Secretary of the Convention.

PROCEEDINGS AND ADDRESSES

AT THE

SANITARY CONVENTION

HELD AT

BATTLE CREEK, MICHIGAN, MARCH 29 AND 30, 1881,

UNDER THE DIRECTION OF A COMMITTEE OF THE

STATE BOARD OF HEALTH

AND

A COMMITTEE OF CITIZENS OF BATTLE CREEK.

PROCEEDINGS AND ADDRESSES AT THE SANITARY CONVENTION AT BATTLE CREEK.

For this convention the following announcement was made by Dr. Kellogg, the secretary of the convention:

SANITARY CONVENTION AT BATTLE CREEK, MICHIGAN, UNDER THE AUSPICES OF THE STATE BOARD OF HEALTH,

In accordance with invitation received from citizens of Battle Creek, arrangements having been made by a local committee of citizens of Battle Creek, acting with a committee of the State Board of Health.

TIME AND PLACE.

You are cordially invited to be present at the sessions of a Sanitary Convention which will be held in the City of Battle Creek, Michigan, on March 29 and 30, 1881.

SESSIONS.

There will be sessions the first day at 3 P. M. and 7:30 P. M.; on the second day at 9:30 A. M., 2:30 P. M., and 7:30 P. M.

During each session of the Convention there will be one or more addresses or papers on some subject of general interest pertaining to public health, each paper to be followed by a discussion of the subject treated.

OFFICERS OF THE CONVENTION.

The officers chosen by the committee are as follows:—
Rev. D. F. Barnes, President.
Hon. George Willard, Vice-President.
Prof. Z. C. Spencer, Vice-President.
Mr. L. McCoy, Vice-President.
Rev. Dr. Sidney Corbett, Vice-President.
Edward Cox, M. D., Vice-President.
Judge B. F. Graves, Vice-President.
J. H. Kellogg, M. D., Secretary.

EXHIBITION OF SANITARY APPARATUS

Manufacturers of and dealers in all kinds of sanitary apparatus or appliances are invited to send specimens of their articles for exhibition at this convention in accordance with the following regulations:

(*a*). The committee reserves the right to decline any article not deemed suitable.

(*b*) A full description of each article proposed to be exhibited must be forwarded to the secretary of the convention with the application for space.

(*c*) There will be no charge to exhibitors for entrance-fee or for floor or wall space.

(*d*) Exhibitors will pay all expenses of transportation, storage, placing and removal of goods, and must themselves be responsible for any breakage or damage to their articles.

(*e*) Every article, model, drawing, or photograph exhibited must bear a descriptive label giving a detailed statement respecting its construction, use, and the price at which it can be furnished, and the name and address of the agent, and place of sale.

(*f*) Exhibitors may employ persons to explain their exhibits, and, properly, to solicit orders.

(*g*) The position in the hall, of articles entered by each exhibitor, will be determined by the secretary of the convention.

(*h*) Exhibits will be received by the secretary of the convention until March 28, 1881, and will be placed in the hall before the opening session of the convention.

Judges will be appointed to examine the various articles on exhibition, and certificates of merit will be awarded to such articles as are deemed worthy.

Records of the proceedings of this convention and some of the addresses and papers will probably be published in the Annual Report of the State Board of Health.

The admission to all sessions of this convention will be free, and the public are cordially invited. Programs for the sessions of the convention will be issued at an early day.

ADDRESSES AND SUBJECTS TO BE PRESENTED AND DISCUSSED.

1. Welcoming address, by the Mayor, Hon. E. C. Nichols.
2. Address by the President of the convention, Rev. D. F. Barnes.

Among the subjects to be presented and discussed, it is expected that the exceedingly important one of consumption—its causation, modes of spreading, and the best means for its prevention,—will be included and receive the attention demanded by its great prominence as a cause of death throughout the world.

Other addresses and subjects will be announced hereafter.

The Chicago and Grand Trunk Railway Company will sell tickets at two cents per mile each way to persons who wish to attend the convention, application to be made to the local ticket agent.

COMMITTEE FROM THE STATE BOARD OF HEALTH.

Rev. D. C. Jacokes, Pontiac; Prof. Edwin A. Strong, Grand Rapids; Henry B. Baker, M. D., Lansing.

LOCAL COMMITTEE.

S. S. French, M. D., C. C. Peavy, J. H. Kellogg, M. D., T. B. Skinner, Hon. E. C. Nichols, Eli Flagg, A. C. Kingman.

The Secretary of the convention will be pleased to give any further information. He may be addressed at Battle Creek, Michigan, as follows:

J. H. KELLOGG, *Secretary, etc.*,
Battle Creek, Mich.

PROGRAM OF THE SANITARY CONVENTION AT BATTLE CREEK, MICHIGAN, MARCH 29 AND 30, 1881.

First Session.—Tuesday, March 29, 3 P. M.

1. Convention called to order by the Secretary.
2. Prayer.
3. Address of welcome—By Hon. E. C. Nichols, Mayor of the city.
4. Introductory remarks—By Rev. D. C. Jacokes, D. D., member of the State Board of Health.
5. Opening address—By Rev. D. F. Barnes, of Battle Creek, President of the convention.
6. Appointment of committees.
7. A paper—Legal and other Measures for the Prevention of Casualties, by Hon. Le Roy Parker, of Flint, Member of the State Board of Health.
8. Discussion of the subject.
9. A paper—Compensations in Hygiene, by Milton Chase, M. D., of Otsego.
10. Discussion of the subject.

Second Session, Tuesday Evening, March 29, 7:30 P. M.

1. Reading the minutes of previous session.
2. A paper—The Invalid Habit, by Prof. Theo. A. McGraw, M. D., of Detroit.
3. Discussion of the subject.
4. A paper—On Sanitation of Rural Homes, by A. F. Whelan, M. D., of Hillsdale.
5. Discussion of the subject.

6. A paper—The Systematic Study of Causes of Sickness and Deaths, by Henry B. Baker, M. D., Secretary of the State Board of Health.
7. Discussion of the subject.

Third Session.—Wednesday, March 30, 9:30 A. M.

1. Reading of minutes of previous session.
2. A paper—The Sanitary Relations of a Single Point in the New Physiology of Alcohol, by A. F. Kinne, M. D., of Ypsilanti.
3. Discussion of the subject.
4. A paper—On Personal Sanitary Responsibilities, by Jno. K. Allen, of Lansing.
5. A paper—Consumption: Is it a Contagious Disease? What can be Done to Prevent it?—By Bela Cogshall, M. D., of Flint.
6. Discussion of the subject.

Fourth Session.—Wednesday, March 30, 2:30 P. M.

1. Reading of minutes of previous session.
2. A paper—On Medicinal Nostrums in their Relations to Public Health, by Prof. Albert B. Prescott, M. D., F. C. S., of Ann Arbor.
3. A paper—Some of the Evils which Result from the Free and Injudicious Administration of Nostrums to Infants and Young Children, by Amos Crosby, M. D., of Albion.
4. Discussion of the Subject.
5. Reports of committees.
6. Voluntary papers and discussions.

Fifth Session.—Wednesday Evening, March 30, 7:30 P. M.

1. Reading of minutes of previous session.
2. A paper—The Health Service of a State, by Geo. E. Ranney, M. D., of Lansing.
3. Resolutions and discussions.
4. A paper—Sanitary Rules *versus* Medical Theories, by Foster Pratt, M. D., of Kalamazoo.
5. Discussion of the subject.
6. A paper—Means of Promoting the Public Health, by Rev. J. Morgan Smith, of Grand Rapids.
7. Closing of the convention.

The following account of this convention is furnished by John H. Kellogg, M. D., secretary of the convention, who kindly furnished a stenographer to record the discussions, etc.

HENRY B. BAKER,
Sec. State Board of Health.

FIRST SESSION, TUESDAY AT 3 P. M.

The convention was called to order by the secretary at 3 P. M.

Prayer was offered by the Rev. T. H. Jacokes.

Hon. E. C. Nichols, Mayor of the city, welcomed the convention in the following remarks:

WELCOMING ADDRESS.

BY HON. E. C. NICHOLS, MAYOR OF BATTLE CREEK.

GENTLEMEN OF THE SANITARY CONVENTION:—It is my pleasing privilege, in behalf of the people of this city, to extend to you a formal welcome. I do this not only formally but heartily.

The work in which you are engaged is purely philanthropic and unselfish, having for its aim the *prevention* of disease rather than its *cure*. Your methods differ somewhat from those of an earlier generation. In that quaint but doubtless veracious history of New York, written by Diedrick Knickerbocker, it is stated that the North American Indians when discovered by our ancestors, were in a state of deplorable ignorance and destitution. But no sooner did the benevolent inhabitants of Europe behold their sad condition than they immediately went to work to ameliorate and improve it. They introduced among them rum, gin, brandy, and other comforts of life, and it is astonishing to read how soon the poor savages learned to estimate these blessings; they likewise made known to them a thousand remedies by which the most inveterate diseases are alleviated and healed, and that they might comprehend the benefits and enjoy the comforts of these remedies, they previously introduced among them the diseases which they were calculated to cure.

Happily modern philanthrophy does not follow that precedent. Your aims are to investigate and apply preventives rather than curatives, and by intelligent presentation of the cause and source of local disease to so inform the public intelligence and quicken the public conscience, that preventive sanitation may precede infection. Surely no grander work can engage the energies of those who would truly serve the human race.

When we consider the appalling horrors of the "pestilence that walketh by noonday" in those eastern countries, where the destroyer cuts down the countless thousands until vast districts are almost depopulated; when we turn to our own shores and remember how the plague swept throughout our southern cities; when in our own State, even in our own city, malignant disease finds so many victims; and when it is known that plague and pestilence, no less than typhoids and kindred malignant disorders, are almost wholly traceable to lacks in local sanitation and local cleanliness, how shall we over-estimate the value of the work in which we are engaged?

That old denial of brotherly responsibility, "Am I my brother's keeper?" crimsoned with the stain of the first murder known to the human family, must give place to that high ideal of Christian civilization which places upon individuals, states, and nations, the responsible guardianship of all human interests.

Little by little the world is realizing that wrong breeds retribution. It is the apprehension of this great truth that gives force and direction to efforts made to alleviate human suffering and to overturn all forms of oppression.

It is in the line of this great beneficence that your work tends, and it will surely receive the hearty support and commendation of all thoughtful people. Again I bid you welcome.

At the close of the address by the Mayor, Rev. D. C. Jacokes, of Pontiac, addressed the convention, on behalf of the State Board of Health, as follows:

ADDRESS.

BY D. C. JACOKES, D. D., OF PONTIAC, MEMBER OF THE STATE BOARD OF HEALTH.

I am very glad that his honor, the Mayor, has relieved me somewhat of explaining the objects of the State Board of Health, and yet there are some remarks to be made in addition; at least I have found it important in some recent correspondence which I have had, that the people shall distinctly understand the objects of the State Board of Health.

First, how are they appointed? The Legislature of Michigan has authorized the Governor to nominate to the Senate two persons each two years to be members of the State Board of Health, and these nominations, if deemed proper, are confirmed by the Senate. Otherwise, no other person or power has to do with the appointment of any member of the Board.

The next question is, who are appointed? Here I shall make some statements very important for you to understand.

First, no man is appointed because he is a doctor; no man is appointed because he is not a doctor. These have nothing to do with the appointment of members of the Board. If a member happens to be a doctor, he is a member not because of that, but because he is a sanitarian; if he is not a doctor, he is a member not because of that fact, but because he is acquainted with the science and art of sanitation. There are many men who are not doctors and there are a large number of physicians, honorable, good men, who have not given attention to the science and art of sanitation. In justice, however, to the physicians, it is proper for me to say (and I say with much emphasis) that we owe to the physician nearly all the important information which we have on this question, although it does not properly belong to his profession. The endeavor is to find men who have an interest in this important question of the health of the people. Whoever are placed on this Board in the estimation of the appointing power have this knowledge.

A large number of doctors and almost the entire population need information upon the subject of public health. From the number of doctors in the State (about 4,000 of all classes, schools, and grades) and from this large number of doctors who are practicing and the large number of young men and ladies who are preparing for this profession, I conclude that there is a large amount of sickness in the State. If these 4,000 doctors receive an average annual income of $1,000 then the good people of the State pay out $4,000,000 in doctor's bills each year. If they get but $500 then the people pay out $2,000,000 each year. No doctor would wish to acknowledge that he receives less than $500 annually, but if the average income is but $250, a million dollars is expended. These bills are just and should be paid. It is argued that there is a vast amount of sickness, and a million of dollars paid annually is a large sum. I think it safe to say that the amount paid to physicians will be doubled by the other expenses attending sickness, and the suffering and trouble is additional.

Now why is this State Board of Health established? Not to cure a single man, woman, or child. That is the business of the physician. The State Board of Health will not tell you what to take for any disease. They have a vastly more important work, and that is to see why there is so much sickness in a State like this. For instance, we have typhoid fever. What in the world causes it? We tell you to examine your drinking-water. You may say it is all right, clear as crystal. We tell you that you don't know that, and if a chemical test is made you will find it very different.

There are a great many other diseases. Here is that wonderful, destructive disease, diphtheria, carrying off little ones by thousands. They want to find out the cause of this so as to avoid it. They cannot tell you how to cure it,—that is left to your physician. He is the one that knows a great deal better than the State Board of Health. Because, as a State Board of Health, we do not study that, for I am a member of the State Board of Health, but as a member of the Board it does not warrant that I understand that great science. We send you immediately to your physician; let him cure the diphtheria. But is there a possibility of stopping the spread cf that terrible disease which is increasing every year? Can we discover any method which will prevent it and save the little ones? That is the great work of the State Board of Health. It is the business of the State Board of Health to study these diseases and point them out to the people of the State. Let me illustrate to you. While in the city of Detroit, I had two little tracts on diphtheria. I met two gentlemen, and one of them said, "How do you do?" I replied, "I am well, how do you do?" He said, "Very well; but diphtheria is up in our neighborhood and I am afraid I am going to lose my children." I put my hand in my pocket and gave him one. He said, "Thank you." I said, "take that home and let your wife read it." The other man said, "I guess they must have it," so he did not take it. My friend took his tract home, read it, and his wife read it. They both studied it thoroughly and just applied the needed prevention; and that family are all alive to-day. Right beside him, within fifeeen feet of the house where he is, the man who said "they must have it," lost the only child he had. We want to know how to prevent, and not how to cure. I received a letter from a doctor a while ago (and will tell you as a secret), giving me a regular trimming. Said he, "What are you doing? You want to take the bread out of our mouths!" I have found quite a number of that class.

Here is the scarlet fever; some people have an idea that the little chicks must have it and they might as well have it first as last. I never had it. I never want it. When I look into the face of a little child, I don't want to think he must have it. We want to see how you can avoid it. Just as quick as it comes we advise you to call the doctor at once.

I am not a practical physician, though I have studied medicine in my younger days. If any one represents a noble man it is the physician. There are doctors who under difficulties have devoted their whole life a legacy to the generation that shall follow. In Illinois they have passed a law that none but educated physicians should practice medicine, and the consequence is large number of quacks are coming to Michigan.

I was walking down town one evening when an individual overtook me and said, "How do you do, sir?" I said, "Very well, thank you." Said he, "You have got a nice town here." I said. "Yes; I see you are a stranger here." He said, "Yes, sir; I came from Illinois. I am a doctor." I said, "What school did you study at?" "I went to school," he said, "down in the State of New York, and I doctor people and horses, too."

I think there are some twelve of these doctors in my neighborhood, come from the West. Real physicians will always have work enough to do. When we are as willing to pay the doctor for telling us how to keep well, as we are willing to pay him when he cures us, we shall not only support these intelligent men, who devote themselves so earnestly to the great work of humanity, but we shall save for ourselves a large expense from sickness and suffering, Say to your doctor, "I want to pay you now for keeping me well," and he will be infinitely pleased to do it. I am accustomed to working for nothing but it doesn't pay worth a cent. You cannot get along without saving money, and as a general rule, when we will pay physicians for information they will be glad to furnish it. The object is to disseminate good counsel in sanitary science.

I have made these remarks for the purpose of correcting public opinion in regard to the objects of the State Board of Health. I thank the mayor for his welcome.

At the conclusion of Dr. Jacokes' remarks, Rev. D. F. Barnes, president of the convention, made an opening address as follows:

PRESIDENT'S ADDRESS.

BY REV. D. F. BARNES.

GENTLEMEN:—Unusual demands on my time for weeks past have left me but little or no opportunity for a preparation becoming this occasion.

The ability found in a convention like this and the object for which you meet are sufficient to warrant the best efforts of the best talent. The object is a most laudable one, having in view the physical well-being of the people.

From the respect we have for the profession or professions here represented. because of the ability and experience which you bring to us, and because of the benefit we expect to derive from the work of this convention, we most cordially greet you. I have indicated that the object of the convention is rather physical care and culture. But I do not overlook the fact, that in the proper care for the physical, we are laying right foundations for the proper care of the mental, moral, and spiritual.

You will pardon any seeming immodesty in the remark I am about to make, when I say there are numerous exceptions to the rule. The rule is, that a well cultured, strong, evenly balanced, symmetrically developed mind must have a correspondingly well developed and well preserved physique. Healthful conditions are essential. There may be what we choose to call the poetic and eccentric casts of mind, so frequently moody and erratic, in numerous instances when these conditions are wanting. But as a rule, for strength, and symmetry, and uniformity in action, these healthful conditions are essential. I feel confident that this position is fully sustained in the history of the past.

On the ground of morals we are equally interested in the question of health. Disease is unfavorable to morals. Many irregularities and morbid conditions in morals are traceable directly or indirectly to the diseased conditions of the physical. When we touch what we call the spiritual, the same is equally true. Spiritual good is more readily secured if the physical is healthy and well disciplined.

It was a wise remark of the late Dr. Finney, President of Oberlin College, that it were impossible to get one converted who had cold feet. If there be unhealthy conditions of the body, a want of proper circulation, or if there be disease, the mind and spirit will be affected out of sympathy, if for nothing more.

The fact is, that with the masses educated in so many things, there is gross ignorance touching a thousand other things that they ought to know. Nor is the matter of ignorance, however detrimental it may be to better conditions, the greatest difficulty; that which is still greater, is the indifference of the people to these vital interests. This indifference must be destroyed. In many instances conscience must be aroused and our intelligence quickened.

How shall this work be accomplished?

We answer, through boards of health; through the agency of health conventions; through the press; through honest work and faithfulness in the professions of medicine and surgery, and through a bold and fearless pulpit, that has a mission at *present* in health.

There must be agitation; no great reform is brought about without it. The people must be instructed and stirred. The people must know that *badly ventilated* houses, sleeping apartments and places of public gatherings, for business or amusement, etc., mean disease and death. They must know that filth, wherever found, whether on the person, in the kitchen, on the walk, in the street, or in imperfect sewerage, is the natural parent of malarial fever, diphtheria, and kindred diseases.

They ought to know that acres of decaying board sidewalk, in a city like ours, not half kept, are poisoning the very life of our humanity. They ought to know that unprincipled manufacturers are supplying our tables with imperfect and even poisonous articles of food. The multitudes ought to be made to feel that excessive use of alcohol destroys the system, and many others that ante-natal destruction is murder!

The country is full of irregularities and evils, and, as a consequence, inconveniences and suffering. To battle with the evils, to meet the ignorance, prejudices and obstinacy requires a great amount of patience and courage. It also requires the highest order of moral courage.

How are the people to be brought to their senses and made willing to co-operate against fraud, and those conditions which engender diseases and originate epidemics—except fearless men who know these things instruct and stir the people in regard to these vital questions? Who shall lead in the crusade against prevailing evils? The people themselves, or the thoughtful, enlightened men and women who know and feel the evils from which we suffer?

We need in this work enlightened, radical men, the far-sighted path-finder, the clear cut intelligent man, scientific men of research and facts, professional men of learning and experience; men of sound judgment; men of conscience, with strong convictions of the right and wrong. Conventions bring to us from the different professions, men of this class.

This convention brings you to us with information and counsel and stirring wants, the results of which are to be blessings to us, and are to add largely to human happiness.

In the name of our city, in the name of health and human happiness we greet you.

I recognize the honor you have conferred upon me, the position given me in this convention. I assure you it will be very pleasing as I know it will be of those associated with me, to meet your wishes and do whatever we can to advance the interests of the work before us. A vast amount of work is to be done. In order to properly dispatch the same we shall need promptness, patience, and wisdom.

Mr. Barnes received a flattering expression of approval from the convention as he concluded his address.

APPOINTMENT OF COMMITTEES.

After the president's address the following committees were elected:

On Resolutions.—Rev. J. Morgan Smith, of Grand Rapids; Prof. Victor C. Vaughan, M. D., of Ann Arbor; Dr. D. C. Hauxhurst, of Battle Creek.

On Sanitary Appliances.—Hon. Le Roy Parker, of Flint; Henry B. Baker, M. D., of Lansing; Dr. J. G. Millspaugh, of Battle Creek.

On Sanitary Literature.—Rev. D. C. Jacokes, D. D., of Pontiac; A. F. Kinne, M. D., of Ypsilanti; Bela Cogshall, M. D., of Flint.

The first paper on the program was by Hon. Le Roy Parker, of Flint, member of the State Board of Health, on "Legal and other Measures for the Prevention of Casualties," and is as follows:

LEGAL AND OTHER MEASURES FOR THE PREVENTION OF CASUALTIES.

BY LE ROY PARKER, OF FLINT, MEMBER OF THE STATE BOARD OF HEALTH.

If a reader of the newspapers, when sitting down to the perusal of the reports of congressional proceedings, the doings of the President, the gossip of political and social circles, the market and stock quotations, or any and all of the almost numberless topics of interest, which the marvellous enterprise of the press of to-day gathers from every quarter and spreads before the reading public, will but turn his attention to the columns where, under the head of casualties, are recorded those unfortunate happenings whereby men's lives are destroyed or their persons injured, he will find, if he be a thoughtful reader and one who takes careful note of passing events, much food for his consideration. In the long daily list he will read of the railroad train which by some mischance is suddenly changed from an elegant and expeditious means of locomotion into an engine of destruction and death. A misplaced switch, a mistaken signal, a careless operator, a negligent train-hand, are reported as the means and instruments of death or dreadful injury to passengers, while the unfortunate brakemen crack their skulls against unguarded bridges, crush their arms in coupling cars, or lose their limbs in the jaws of the deadly frog. He will read of the steamboat crowded with passengers suddenly blown into the air, cut in two by collision, or burned to the water's edge, while dozens of precious lives are lost through insufficient means of escape. The life-boats are out of order; the life-preservers are not properly placed or sufficiently provided; the man at the wheel was negligent of his duty; the boilers were defective, or the fire apparatus would not work. In one place a theatre takes fire, and a struggling mass of humanity surges against unyielding doors, which open inward, or choke the narrow passage-ways which afford exit, till the frantic living tread upon the suffocated dead, in their mad haste to escape from the more dreadful fate of fire. A grand-stand thronged with happy people, eager to see some contest of speed upon the race-track, suddenly gives way, and the voice of mirth is changed into the agonizing cry of the wounded, or hushed in the awful silence of death. A few dollars of expense saved in its construction, an inexperienced builder, and defective architecture have been the direct means of producing a frightful slaughter. Under the jocose head-lines of "Didn't know it was loaded" will be found the story, far too often told, of some rash youth pointing a gun or pistol at a comrade in play, and proving too late that it *was* loaded and that death lay in the load. Another paragraph recounts the exploits of the servant-girl with her can of oil and the kitchen stove. The two combined produce a mortuary notice for the paper and a bill for the insurance company to pay. A kerosene lamp, filled with "Michigan test," warranted not to explode, because the inspector has tested a pint of oil taken from some one of the same car-load of barrels, suddenly bids defiance to the inspector's certificate and proves the inefficiency of the inspection by exploding and scattering fire and destruction on every side. A defective boiler in some mill or factory, shabbily constructed or worn by long use, with no system of inspection to guarantee its safety, yields to the imprisoned force within and gives still another item to the press and additional subjects for the coroner's jury to sit upon. An absent-minded drug-clerk takes the wrong bottle from the shelf and, instead of quinine, deals out strychnine and death in the same package to his customer, and so on down the column. Every day of every year one may read of casualties by rail or upon the sea, in theatre or grand-stand, by gunshot or kerosene, by steam explosion or poison,—varying only from day to day in kind and the number of the slain. I think it would be an interesting subject of research for any one with the time and inclination, to carefully collect the accounts of the various accidents as they are reported from day to day or from week to week in our own State, and at the end of the year tabulate the results so as to show how many of each kind have occurred. It could then be easily ascertained what per cent of the total number of casualties were of a character which might be prevented by proper care. I imagine that the majority of newspaper readers rarely study the list of casualties and so can have but little idea of their number and frequency. It is only when the telegraph lines thrill with the story of such a disaster as that of the falling of the Tay bridge, the burning of the Sewanhaka, our own recent Jackson casualty, the collision between the Garland and the Mamie, or the falling of the grand-stand at Adrian, that the public mind is aroused and feels the sense of horror which such accidents produce. When such do occur there is an instant demand by the public that the causes shall be investigated, the reason of their occurrence searched into, and that the person or persons responsible for them shall be dealt with according to the extreme penalty of the law. Then the public insists that there is a moral responsibility existing somewhere for such casualties, and that if proper measures were taken their occurrence might be greatly if not wholly prevented. It too often happens however, that with the lapse of time, the recollection of the awful disaster is driven out of mind by the throng of thick-crowding events which in this busy life of ours are forever chasing one another and treading hard upon each other's heels. The most frightful disaster which occurred during the last year, a year which was prodigiously rife with startling and fatal casualties, did not excite even the customary nine days' wonder. The press blazoned forth the news in minute details and displayed headlines for a day or two; the coroner's verdict was published; a little later an account of the impressive funeral ceremonies over the victims was given, and then the ripples of excitement died quickly away. Whatever demand was made by an aroused and indignant public for the adoption of some preventive measures, which should render the occurrence of such disasters impossible, was asked of the wind, for all the answer that it received, and ceased with the dying out of the excitement which accompanied each event.

After thus enumerating some of the more common forms of casualties, the question may very pertinently be asked, "What can be done about it?" "Is there any reasonable hope or expectation of making accidents any less frequent? Can legal enactments or any other means of prevention be devised, more than now exist, whereby these occurrences, which are so often unforseen and well nigh unavoidable, may be prevented?" These questions can perhaps be answered only in a roundabout way. It is first necessary to determine whether any or all of the casualties which produce injury to life or limb are of a character that may be considered preventable. Then if we find that any or all of them are, the answer is easy, whether the application will be or not, —they certainly can be prevented.

Second, we can ascertain what has already been attempted by legal enactment or otherwise to lessen the number of accidents. If we find that the strong arm of the law has been employed successfully in certain directions to do away with the frequent recurrence of particular forms of accidents, we may safely assume that its preventive power can be exercised in still other directions with nearly if not equally as great success.

Third, is there a public sentiment or can one be created which will continually and persistently favor the enforcement of legal measures for the prevention of preventable accidents? If there is not, there certainly can be no great good accomplished by any legislative enactment.

The efficiency of any statute depends upon the extent to which public sentiment favors its enforcement. A law is not worth the paper it is printed on if the people will not enforce it. Our first question then is: Can accidents be prevented? Strictly speaking, every casualty happens through the negligence or want of care of some one who might have foreseen and guarded against it, and is therefore preventable, excepting, of course, certain ones which are the result of the act of God and not of man's agency. These last need not be considered in the discussion of this subject, except so far as to define them and distinguish them from those which are due to some act or omission by man.

But in dealing with every question relating to human affairs we must treat it from a human stand-point. We must not expect perfection when perfection does not exist. Everything which imperfect man has do with, must be affected and influenced by his lack of perfection. In the management of railroads, steamboats, steam engines and the like, there is a point beyond which man's capacity for care cannot go. To require otherwise would be to demand impossibilities. It follows then that there may occur some accidents which might be guarded against if the highest possible intelligence and the perfection of foresight were employed, but which the knowledge and care possessed by fallible man is powerless to prevent. An admission of this proposition will aid us materially in arriving at a correct conclusion.

In popular estimation, railroad accidents are by far the most frequent of occurrence, and the most fatal in their results. But when we consider the millions of passengers conveyed by railroad trains every year and the enormous impetus given to the trains by force of steam and their great weight, the wonder is that fatal casualties are not more frequent and the death list vastly larger than it is. The reports of the Railroad Commissioner of this State, show that for the years 1877 and 1878 not a single passenger lost his life while traveling on any of the railroads of Michigan. This is certainly a remarkable showing, and if each year could show the same result it would reflect great credit upon the careful management of our roads. But in October, 1879, occurred the noted Jackson disaster upon the Michigan Central Railroad whereby fifteen persons were killed and twenty-six were injured. If the same road could run for two years previously without killing a single passenger, might it not by proper precautions have done as well the third year? Was this a preventable accident? The yardmaster, contrary to well-known rules of the road, ordered a switch engine and train upon the main track, at a time when the Pacific Express was liable to arrive within ten minutes. It was a reckless and unwarranted piece of criminal carelessness on his part. Had he been more willing to follow the orders of the company, and less anxious to save a little time, by taking the chances of running the switch train on the main track and off again before the Pacific Express should come, the disaster could not have occurred. It appeared from the evidence before the coroner's jury that there was a curve in the track a half mile to the east of the scene of the accident, and a cut between it and the switch, so that the danger signals could not at all times be seen at a sufficient distance by trains approaching under great headway, to enable them to pull up. The coroner's jury suggested, upon the evidence before them, the propriety of providing additional safeguards and danger signals, and the necessity of establishing such signals at a point further eastward than those then in use. Thus by implication saying that the safeguards there provided were insufficient to prevent accidents. Had there been sufficient signals provided (and had the yardmaster performed his duty), this, the most terrible accident of the kind which has occurred in our State, might have been prevented. The greatest responsibility for this occurrence, of course, rested upon the yardmaster. The railroad company were only remotely to blame; yet they might have employed a more careful man, and have provided better signals so as to guard against the negligence of their employees. The yardmaster has been accounted a faithful man, the signals were deemed sufficient. They paid the penalty for this negligence in the shape of a hundred and twenty-five thousand dollars, voluntarily given to the injured and the representatives of the slain, and in the damage to their engines and cars, amounting to many thousands more. This was a heavy penalty to pay for a mistake in the selection of an employee, and for insufficient signals. Can it be doubted that this and other railroad companies will use every precaution which ingenuity can suggest to avoid the recurrence of such accidents, when so great a loss falls upon them in consequence? The great law of self-interest, it seems to me, ought to be the strongest incentive to use the highest possible degree of caution. An inquiry into every casualty upon railroads whether to passengers or to employees would doubtless show that in almost every case the injury was the result of neglect upon the part of those operating the road or the carelessness of those injured.

There are some accidents to railroad trains caused by the breaking of rails in extremely frosty weather, by the falling of trees, by the placing of obstructions upon the tracks by malicious persons, and in other ways beyond the immediate control of the companies, which can only be prevented by the most constant watchfulness; yet even these may be anticipated and guarded against. When the late Czar of Russia, whose death has just been accomplished by Nihilist assassins, traveled upon any of the railroad lines of his empire, a pilot engine always went before his train, in order to explode any mines which might have been placed under the road-bed, and to receive any damage which might occur from defective rails or from obstructions on the track. This precaution is sometimes taken on great occasions upon our own roads. The American people are all sovereigns; why should not as great pains be taken to guard their precious lives as that of the Czar of all the Russias? Many of the most frightful losses of life upon our lakes and rivers are the result of collisions. Can these be avoided? It would seem that upon a broad river or lake, with simple and easily remembered rules for navigating vessels, there need be no danger of vessels cutting into each other and destroying scores of human lives.

Yet only last summer, in a night that was bright with moonlight, the ill-fated Mamie was run into and sunk by the steamer Garland in the Detroit river and many lives lost. Some one was to blame. A very little care could have steered these two vessels clear of each other and those lives could have been saved. Was the burning of the Marine City last year wholly without fault? Might there not have been such precautions taken in the construction of the boat as to have prevented its taking fire? Were there such ample provisions made for extinguishing the flames as would have made their rapid spread an impossibility? Clearly not, or this disaster never could have occurred. The investigation by the coroner in the case of the falling of the grand-stand at Adrian in 1879, by which nearly 20 persons lost their lives, and between two and three hundred were injured, reveals the fact that the structure was most shabbily built, with a reckless disregard of the first principles of mechanical construction, and seemed to have been put up with a view to save money rather than human lives. Such an accident is possible only as the result of the grossest criminal neglect. The simplest precautions might have prevented it. When we look into the causes of other casualties which are constantly occurring, we shall find that in nine cases out of ten, they could have been prevented by a little foresight, a little caution, and less carelessness. Does any one doubt that carelessness and neglect can be prevented? If they can, then the great majority of accidents may be prevented.

The next question in order is this: What has been accomplished in the way of the prevention of casualties by legal enactment or otherwise? We shall find by an examination of the common and statute law that it was very early held that a person was legally responsible for damages resulting from his own negligence or carelessness; and for the killing of another accidentally, through some wrongful act, neglect or default, he might be indicted and punished criminally, but no action for damages could be maintained in such case until after the passage of an act by the British Parliament in 1846, familiarly known as Lord Campbell's act. This act was adopted into the laws of our own State in 1848, and is also made a part of our general railroad law. It provides that, "whenever the death of a person shall be caused by wrongful act, neglect, or default, and the act, neglect, or default is such as would (if death had not ensued) have entitled the party injured to maintain an action and recover damages in respect thereof, then and in every such case, the person who, or the corporation which would have been liable, if death had not ensued, shall be liable to an action for damages, notwithstanding the death of the person injured, and although the death shall have been caused under such circumstances as amount in law to felony."

We have, then, two remedies for those accidental injuries or killings which result from the wrongful act, neglect, or default of another: First, the person offending may be indicted and punished for manslaughter; second, he may be proceeded against in a civil suit for damages. When an accident occurs upon a railroad or steamboat, through the wrongful act, neglect, or default of any of those engaged in operating them and an injury is caused to a passenger, he can recover from the company damages for his injury; and in case of his death his personal representatives may recover such damages as a jury may award. So well settled is this principle that railroad companies are very prompt to pay for the damages caused by such accidents without waiting to be compelled by process of law. The same principle is applicable to any other form of casualty occurring through the neglect or default of another. These remedies of course are in the nature of penalties imposed by the law, requiring the corporation or persons responsible for the injury to pay for it. They do not directly guard the public against injury, any more than the penalty inflicted upon a thief or a murderer protects the public from robbery and murder. They act indirectly by appealing to the self-interest of those liable to do injury, which should lead them to escape punishment and to avoid the payment of damages, by exercising greater watchfulness and care in the conduct of their business. The law has provided certain safeguards against casualties, in a direct way, by the enactment of statutes which require precautionary measures to be taken by railroad companies, the owners of steamboats, the proprietors of public halls, hotels, etc., to prevent the occurrence of accidents. Our railroad laws fairly bristle with provisions requiring the companies to exercise the highest degree of caution and diligent care. They are required to use bells and whistles to announce the approach of their trains; they must put sign-boards across each road-crossing; an engineer or conductor is guilty of a disdemeanor if intoxicated while in charge of a train, and any damage is incurred. Any employee of a road who shall knowingly violate any rule of the company, may be fined and imprisoned. Trains must come to a full stop before crossing any other railway on the same grade. Railroad companies must fence their tracks and provide suitable cattle-guards. They must use continuous air-brakes. The railroad commissioner is empowered to inspect any line of road and to direct such changes and repairs to be made as in his opinion shall be necessary to secure the safety of the traveling public.

The steamboat inspection laws of the United States require the inspection of all boilers and hulls, the examination of pilots and engineers, the keeping of sufficient life-boats and life-preservers on each vessel for the use of passengers and crew in case of accident; ample provision must be made for guarding against fire and extinguishing it. Such a law ought to be made to apply to all steamboats plying in our inland lakes wherever they are not subject to the inspection laws of the United States.

A law of this State provides that an inspection of churches, theatres, opera houses, school houses, and public halls where large numbers of people are accustomed to assemble, shall be made from time to time, in order to ascertain whether they are safe in all respects. The doors of all such buildings are required to be made so that they shall open outward, so that audiences may be able to disperse quickly in case of fire or panic. Hotel proprietors are required to provide some means of escape for their guests in case of fire, and to keep fire-extinguishers always ready for use. The careless use of arms is forbidden, and inspection of illuminating oil is required, and in many ways the law endeavors to prevent the occurrence of accidents, by particular enactments. It is, of course, impossible to determine to what extent the occurrence of fatal casualties has been diminished by the adoption of these various precautionary statutes, but it is only fair to infer that so far as they are obeyed they must prove beneficial. Nor is it possible to say to what extent they are observed by those to whom they apply. My observation leads me to think that in the case of railroads these statutory provisions are very generally obeyed. In the case of steamboats of the larger class, they are also generally observed; in the smaller craft less attention is paid to them. Probably less than one-half of the halls for public assemblages throughout the State are inspected, or arranged in accordance with the requirements of the law, while very few hotels provide their guests with any means of fire escape. It is doubtful whether the inspection of oil is as thorough as it should be throughout the State. In the city of Detroit the insufficiency of the inspection has become so notorious that a new law, providing for the inspection of oil used in that city by local inspectors under the direction of the fire commissioners, is asked for by its citizens, and is now before the Legislature for its action.

As proofs of the frequency of casualties where no preventive law is observed, I will read two or three extracts from the newspapers published just after the Fourth of July last. The following is from the "Detroit Evening News:"

> "Thus far the tally is as follows: Fourth of July foolishness in Michigan, debtor, to twelve drowning accidents, two crushed feet, four persons whisky-killed, four shot fatally, two stabbed, twenty-nine boys and two girls wounded with shot, sixty-two boys and one girl disfigured by powder-explosions, two wounded by bursting guns, and seven hurt by runaway accidents. Several counties are yet to hear from."

And these two from the "Post and Tribune," of July 5, 1880:

> "The absence of fires, accidents, and distressing racket from the city yesterday attest the wisdom of the prohibitory restrictions placed upon the use of fire-crackers, squibs, pistols, and the other means generally employed to make Independence Day the most uncomfortable day in the year. Although there were several thousand strangers in the city, and most of our own citizens made yesterday a holiday, the streets were quiet; up to the present writing, late in the evening, not a single fire-alarm has been sounded, and not a single serious accident has been reported. The experiment of suppressing the ordinary noisy nuisances of Independence Day has been so nearly successful this year as to warrant the retention of the ordinance, and still more vigorous efforts to enforce it in the future."
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> "The advocates of the gunpowder celebration of the Fourth of July should ponder the reports in the Chicago papers. On Sunday no less than thirteen persons were shot in that city, one probably fatally. Monday's returns will probably double that figure. Here in Detroit, where the ordinance against the murderous and foolish use of powder was at least partially enforced, no accidents at all have been reported up to the present writing. Look on this picture, and then on that."

In very many places in the State little attention is paid to the statutory requirements for the prevention of accidents. In many instances the people seem to think these provisions too trivial to be attended to. It is only after some terrible accident that particular attention is called to the laws which stand upon our statute books, which if obeyed might have averted the disaster. But in nearly every case nothing but talk follows. I do not recall an instance where a person guilty of manslaughter through his neglect or default has been convicted for his offense. There seems to be a shrinking on the part of the public from the enforcement of a penalty against persons guilty of such crimes. Until there is a popular demand that no guilty person shall escape, there will be a laxity in the observance of the laws upon this subject. It often happens that the persons responsible through neglect for some terrible accident are among the best of our fellow citizens, and there is a natural disinclination to treat them as criminals. Yet they are criminals in the eyes of the law, and should be dealt with as such. If the punishment for negligence were as certain to be meted out to this class of offenders as it is to the intentional murderer or burglar, I am sure that the occurrence of casualties through carelessness and neglect would largely diminish. It would induce greater care in the running of railroads and steamboats; in the arrangement of public halls and hotels; and greater attention would be paid to the security of human life in every way in which it might be affected. We might learn a lesson from Bulgaria, where if life is lost by an arch or bridge or house giving way, the architect is promptly thrown into prison until he can prove that the accident occurred through no fault of his.

Let us now consider what legislation is needed and what precautions can be taken to guard against casualties in the future. We have already seen to what extent provision has been made by law for guarding the public against accidents, and we must be convinced that legal prevention has accomplished much good. But more can be accomplished still. So long as fatal casualties are of such frequent occurrence, there is need of a more rigid enforcement of the laws already enacted, and also need for the passage of other and more stringent regulations.

In respect of railroads, there should be a more perfect and uniform system of danger-signals. There should be some safeguards provided for employees who may be upon the top of freight cars when passing under bridges. Two bills are now before the present legislature for this purpose,—the one providing for a uniform system of signals, to be prescribed by the railroad commissioner, the other requiring railroad companies to place warnings before every bridge, to give notice to employees of the danger ahead.* A frequent cause of accidents to employees are the crude and hazardous coupling-links used upon freight cars. Some device should be adopted whereby cars can be automatically coupled, thus avoiding the necessity of the brakeman going between the cars.

Color-blindness, or the inability to distinguish between colors, has been found to prevail among men to quite an extent. A railroad employee so affected would be unable to distinguish between green and red lights. It is important that all employees, whether of railroads or steamboats, should be able to tell the difference between these cautionary signals. To this end, all employees should be carefully examined by an expert to ascertain whether any defect of vision exists which might be the means of causing disaster.

A complete system of inspection of steam-boilers used anywhere in this State should be required. There were no less than one hundred and seventy boiler explosions in the United States in 1880, by which 259 persons were killed and 555 were wounded. Had such a system of boiler inspection prevailed throughout the country as is required by the United States government upon steamboats navigating the ocean and the great lakes and rivers, very many of these casualties might have been avoided. As it is, there is no guaranty whatever about a steamboiler, to be used on land or in the small internal lakes, except the honor of the maker. They are coming into such common use that the danger from them is yearly on the increase.

There should be an inspection of the boilers and hulls of the steam craft which ply upon our inland lakes. They are often loaded to the water's edge with excursionists, and the occurrence of any serious accident to the boat would be followed by a large loss of life. No life-preservers or small boats are required to be carried, so that in case of an explosion of the boiler or the boat's taking fire, there would be no possible chance of escape for the unfortunate passengers.

A more rigid inspection of petroleum products must be insisted upon. A low-test oil is a fruitful source of danger to life and property, and not a quart should be allowed sold in Michigan which has not been fairly and fully inspected. Other preventive measures will suggest themselves, from time to time, and whenever a human life may be saved by the enactment of a law, that law should be passed. But statutes alone will not prevent casualties. There must be a popular sentiment back of the law to sustain and enforce it. With a healthy public sentiment, armed with sufficient legal power, the frightful frequency of casualties of all kinds may be very much decreased, and the eagerness with which we as a people strive to prevent their recurrence, will be an indication of the value which we place upon human life.

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* [Act 175, laws of 1881, provides for a uniform system of signals to be prescribed by the railroad commissioner, and Act 190, laws of 1881, provides for safetyguards before bridges to warn brakemen of the approach to danger.—H. H. B., Sec. S. B. of H.]

DISCUSSION.

Dr. D. C. Hauxhurst, of Battle Creek, said:—

MR. PRESIDENT:—There is one point to which I would call attention for a single moment. There can be no doubt but that an examination should be made of all employees on the railroads whereby to determine their fitness for the work which it is their duty to perform; also the employees on board steamboats, captains, pilots, and all that class of men, architects, builders, men who are in any capacity called upon to do that which may be done badly and thereby bring disaster upon the public, or upon individuals. If we have careful, preliminary examinations, whereby to determine the fitness of these men to perform the duties which lie before them, we shall in some measure guard against the disasters which are now so frequent. In some departments this has been done already. We insist that teachers shall pass certain examinations, that they shall be intelligent, that they shall be found competent for what they have to do, and do it well. If the teacher simply offers herself without any examination, it can only result in failure. In military tactics members are rigidly examined. It has for a long time been known that a physician cannot get a place in the regular army without possessing a very high degree of proficiency. The question here might be asked, is not the ordinary physician as much in need of education and skill as the army physician? In other words, does not tho citizen require as skillful medical care as the soldier? Any man may put out his sign and begin to treat disease without any preliminary examination whatever, or even any preliminary study. It appears that each individual is left to determine his own fitness. It takes the skilled and practiced physician, as an examiner, to determine whether another physician is fit to do his duty. In law there are examinations, and persons are admitted to the bar upon a careful estimate of what they can do, and how well they are fitted for their duties. But in many departments of life there are men who go to their duties entirely unfitted to perform them. These men are properly termed quacks, and quacks are very numerous. Preliminary examinations are to be desired in all departments. It is to throw out a hint regarding their necessity, that I have made these remarks.

H. C. Fairbank, M. D., of Flint, said:—

MR. PRESIDENT:—I wish to allude to a practice prevalent in our country of employing men who are in the habit of using intoxicating drinks; on our steamboats, railroads, and in most every line of business where there is responsibility and danger. I have for many years thought it highly important that some stringent regulations be adopted by officers of different corporations, employing a great many men, to reject every applicant who is known to use intoxicating liquors habitually. I have a number of times been upon the Mississippi river, and have invariably seen a drunken captain, a drunken pilot, or a drunken engineer; and I never laid down in my berth at night without fear and trembling that an explosion or a disaster might occur before morning. I have often seen men under the influence of liquor excitedly throwing tar and other combustible material in the engine, that they might get up steam enough to outrun some opponent on the river. I have seen it practiced to some extent on the railroad and in other lines of business. This may be done contrary to the instructions of employers, but these men under the influence of liquor are endangering the lives of other persons. I really and sincerely hope that public sentiment can be aroused and that this body may give some expression of disapproval to the practice of employing any person in any capacity whatever, on our steamboats, railroads, or in any manufacturing establishment, that is in the habit of using intoxicating drinks and thereby endangering the lives of others.

Mr. A. C. Kingman, of Battle Creek, said:—

MR. PRESIDENT:—It is certain the enactment of laws of itself will not prevent casualties. I think the paper made this suggestion. I think the education of the people up to the sentiment of enforcing laws is what will tend to prevent casualties. The law is a good thing and provides a remedy, and when a man puts his life into the hands of a railroad company or a steamboat company, and comes out with his limbs broken, he wants something in the way of satisfaction. The public must be educated up to the sentiment of making rigid laws and enforcing them. Another thing suggested to me is that a great source of the accidents and casualties is in an ill-considered economy in the construction of public buildings, railroads, etc., which are constructed for the purpose of making money for the owners, who put in the least amount of money possible, but get out the largest dividend, which, of course, is the pay of the man who has invested his capital; but it is for the good of the people that he construct things in the best possible manner, and not to see how cheap he can build them. When a public building is constructed in a city, or small town more especially, we can see how hard it is to enforce a law enacted by the legislature which may shut up that building against the owner, and great loss is thereby entailed. This is one of the great sources of casualties, an ill-considered economy, and a dislike on tho part of the public to disturb a man for fear of hurting his feelings, if it is going to make him spend some extra money in the erection of his buildings.

Rev. D. C. Jacokes, of Pontiac, said:—

MR. PRESIDENT:—I want to say just one word about that paper in defence of women and children. We need the most careful inspection of buildings. I notice that nearly all people burned are women and children. When the last law on this subject was passed I went home and told my wife about it, and said: We have been living together almost half a century and I cannot afford to burn you up. I got some Mineral Seal oil with which you can burn no one. It is perfectly safe, and burns as long again as other oils. People cry, "economy, economy." I dare not take upon myself the tremendous responsibility of burning up my family to save a few pennies in a year.

H. O. Hitchcock, M. D., of Kalamazoo, said:—

Mr. President:—"I didn't mean to" is what is urged by individuals when their own conduct has produced an accident, and they suppose it excuses them. I believe there is, way down at the root, in the character and in the way we have been educated, an element developed which produces accidents. My children will sometimes say, when an accident occurs with them, "I didn't mean to," but I say to them, "You must mean that you did not want to do it." We must be keyed up all the time against doing evil, and not pass along so easily. It is the same with all the hands on the railroads,—"They didn't mean to." So much must be done in such a time. It is haste, haste, haste, all the time here, so that we must do things with the very cheapest of labor. We have got to educate our people otherwise, if the thing we aim at is safety. These great manufacturing establishments over here at Nichols' would not say to an individual, who, by an act of his, should do great injury, "I will excuse you because you 'didn't mean to,'" but they would hold him responsible. We should be conscious of the possibility of an accident and be guarding against it all the time. They would not excuse an accident because one wanted to do so much in an hour. They would hold that safety, prudence, and diligence was all they asked of them. This feeling of safety should be brought to bear upon every one. It is not how much can be done or how many miles of track we can be drawn over in a brief period, but it is how safely we can be drawn over it; and every one should be constantly feeling the possibility of an accident and guarding against it.

Owing to the length of the discussion on Mr. Parker's paper, the reading of the paper on Compensations in Hygiene was put over to the evening session.

SECOND SESSION, TUESDAY EVENING, 7:30 P. M.

The necessary absence of Prof. McGraw and Dr. Whelan necessitated the loss of the papers on the program assigned to those gentlemen.

The paper on Compensating Conditions in Hygiene, by Milton Chase, M. D., of Otsego, was then read, in the author's absence, and is as follows:—

COMPENSATING CONDITIONS IN THE CAUSATION OF SICKNESS.

BY MILTON CHASE, M. D., OF OTSEGO.

Because we find ourselves in this world intelligent, reasoning beings, capable of feeling pain and pleasure, and possessed of a consciousness that we have some control over our destiny, we have to infer that comfort and happiness is what should naturally come to us. In that God is good I believe that we are capable of acquiring knowledge that can guide us and ours from the cradle to the grave without sickness, pain, or trouble. Laws that emanate from the Infinite are fixed and definite and everlasting. The law that let slip the first case of small-pox, typhoid fever, or diphtheria, is as operative now as then. So it is with the law that let scarlet fever run so rife that it was said to be epidemic in the city or State. These laws will be as definitely fixed in the future as they have been in the past. The laws that the sanitarian seeks to understand and make of practical utility to his fellows are just as definite as those learned by the astronomer or the mathematician. The sanitarian is a new discoverer in a new field, and his enthusiasm to do his fellows good has driven him to some hasty conclusions that have been proved false, and some other of the conclusions are doubtful, and the good he has promised to bestow upon the people has not always been forthcoming, yet the people should not lose faith in him, or drop back to the superstition that epidemics are God's scourges to punish humanity for their sins, and consequently cannot be averted. The positive assertion that typhoid fever and diphtheria are diseases arising from filth about the premises, and that only the shamefully filthy have these diseases, has so much that seems to disprove it, that comes within the range of observation of common-sense people, that it is disbelieved by people at large, and sanitarians will lose the confidence and trust of this commonwealth if they insist upon the statement and cannot make the proof clear to the large majority. Facts and laws of nature are fixed and stubborn things, and we must be careful not to call our opinions and theories facts and laws. Let us call things by their right names and we shall not deceive ourselves and others.

People can live season after season over cellars, with water in them, floating large quantities of rotting vegetables for a month or two each spring and have good health. They can live year after year and take water from a surface-well that gets drainings from a barnyard or privy and keep in good health. People so living can have and recover from typhoid fever and diphtheria, and about every town in the State can furnish such examples. The assertion that such surroundings are harmless would not be warranted by theory or facts. When persons so situated escape unscathed it is probably the case that they have compensating hygienic advantages in some other direction. I think it fair to claim that there is vicarious work in hygiene, and that whereas we may be faulty in one line of hygiene, by extra work in another direction we may more than compensate for our defects. To illustrate this point: I have known several men, who were hard drinkers, living in open shanties and log houses. Their digestion was badly deranged, but lungs were good. In this state of affairs they have moved into what carpenters called well-built houses, and soon sickened and died. Reflecting on these cases I came to the conclusion that their new houses did not let them have enough fresh air and they died from the lack of it. Their apparently better house was really, for them, a worse one. A thought I want to bring out here is, that sanitarians have not erred as to kind in pointing out unhealthy influences, but may have erred as to degree or importance of these influences. They have used the definite adjective "the" when they should have used the indefinite adjective "a" in speaking of cause of disease.

People may paint the walls of their dwellings with arsenite of copper and live out their three-score and ten years in good health if they have the doors and windows freely opened night and day. Walls rendered impervious to the air by papering demand more open doors and windows than do brick and mortar walls. I really believe that at the present what are called good houses are bad ones, and I may add just here that those who are said to be good livers are bad livers, that is, that living to eat is a mistake punished by sickness and death. My own limited experience in sanitary work led to disappointment but not to despondency. It caused me to think about matters of sanitation and made me full of faith in the good that is to come from an intelligent study as to how to prevent disease. It seems a reasonable move in the good and right that must, by and by, bring success. Until 1879 I had never encountered an epidemic or endemic of diphtheria, and when I had gone through it some things which I had acquired as knowledge proved to be fallacious theories, and what is annoying to me is that my patrons found it out as soon as I did. I believe that a great amount of fresh air is the best disinfectant, and that there is no substitute for fresh air. I believe that free chlorine in the sick-room is injurious to patient and attendants and fixed chlorine is useless. The parasitic theory of this disease is far from proved, and the use of parasiticides don't tend to prove the theory. Dirty houses and dirty surroundings did not furnish the worst or most intractable cases of the disease, and I came to the conclusion that dirt was not the cause of the disease or even of its virulence. I do not believe that contagion is the only cause for the spread of the disease. I believe that sporadic cases are very frequent in an epidemic. The positive statement that foul cellars and foul wells must be cleaned before the sick can recover from typhoid fever and diphtheria is not borne out by fact. Nor is it necessary that rooms or dwellings should be saturated with disinfectants in order to protect the rest of the family from these diseases, when there has been a case of the kind in the house. A public funeral with a corpse from these diseases does not always spread the disease disastrously through the neighborhood, as a matter of fact. Let us say to the people that we have a theory that disinfectants will do good, and that corpses from contagious diseases may be the means of spreading the disease, and ask them to coöperate with us in testing the matter. Let us not ask for coercive legislation upon a guess that it may be useful. I feel warranted in asking my patrons to pay out money for disinfectants, to repaper, repaint, and whitewash a room, to boil and wash all clothing about body and bed, and clean or destroy carpets of the room where patients have contagious diseases. I also feel warranted in asking them to quarantine themselves for a time, and I am pleased to have them do so. But where they refuse to do so I do not feel warranted in using force and taxing the public for this purpose. If we had positive knowledge as to how these diseases were spread and as to how we could stop their spreading, then I should feel justified in asking the jailor and city treasurer to officially help to stamp out the scourge. I feel it my duty to advise the private burial of a corpse from a contagious disease. If I had the power I should hesitate to order it. The uncertainty makes me timid in these matters. Dr. Billings, the worthy vice-president of the National Board of Health, said, at the sanitary convention held at Detroit a little more than a year ago, that "sanitarians ought to be careful and not exaggerate the importance of their work, when talking to the public, for the people will detect the exaggeration and then incline to disbelieve it all."

I am free to acknowledge that I do not have access to much sanitary literature and cannot claim to have seen the latest, but I shall venture the statement that we do not know the real cause of a single one of the contagious diseases, and that there is not a theory in regard to the cause of one of them that some intelligent and honest sanitarian would not controvert. Because of this, we had better not demand, but had better beg mildly that the people pay out their money and lend their labor to barricade out an enemy that we do not know whether it comes flying in the air, crawling on the ground, swimming in the water, or burrowing in the earth, or hidden in temperature, or on the wings of electricity, or tied to the tail of ozone, or carried by the hands of the hygrometer. I think it well and right that a man or the men who are studying how to keep disease out of the State, or are trying to learn how to lessen disease in the State, should have State aid in the study. I think that it is well for the State to hire a few men to work in this direction. I am glad that our State has established a State Board of Health and cautiously set them at work. My impression is that there are no fattening salaries connected with it, and I hope there will not be, for the lean kine are the fastest workers.

There is room for an immense amount of work in the field of public sanitation. The workers that will be paid by the State are few, and at present they work as hard for their salaries as do any of the employees of the State. The State Board of Health are asking for a good deal of gratuitous labor from the physicians of the State, and I understand that they are getting quite a generous response. I was a little shocked and pained, and much chagrined, at our late State medical association to hear some doctors say that they felt it an insult to have the State ask them to devote any time or labor as a public gratuity. They denied owing any duty or gratitude to the State. How much time and labor each individual shall devote to public work each must decide for himself, but that each one of us will feel better and happier by so doing I have no doubt. I ask of the people here assembled to generously interest themselves in the public sanitary work and the work of the State Board of Health. Criticise all you please, but if you see any good in it help it along.

DISCUSSION.

Dr. Cox moved the thanks of the convention for the unique paper.

Rev. D. C. Jacokes said:—

MR. PRESIDENT:—I say that is the most unique paper of the 19th century. The doctor is a stranger to me, but I am good for what I promise. If he will bring me creditable proof that a man may live in dirt and filth, and hope to live, I will pay him $1,000 in gold.

A line from the author says he expected the most good to result from the discussion and the paper "was made pointed so as to excite criticism." If the author had been present it is probable the discussion would have been continued further.

Following this paper was one by Henry B. Baker, M. D., Secretary of the State Board of Health, on The Systematic Study of Causes of Sickness and Deaths. The paper is as follows:—

THE SYSTEMATIC STUDY OF CAUSES OF SICKNESS AND DEATHS.

BY HENRY B. BAKER, M. D., SECRETARY OF THE STATE BOARD OF HEALTH OF MICHIGAN.

The first and most constant need of the sanitarian is accurate knowledge respecting those most common of all occurrences—sickness and deaths from diseases which during years and series of years have afflicted mankind. If it seems strange that there is so great lack of knowledge on such common subjects it must be remembered that sanitary science is one of the latest sciences, and that physicians, as such, have had no need to record or to note many of those classes of facts which form the foundation of sanitary science, though some have had occasion to contribute greatly thereto. The prevention of sickness has not been their work, and the collection of facts respecting vast numbers of cases of sickness or deaths involves labor and expense too great to be borne by individuals, unless the knowledge gained thereby is such as will advance the work in which they are engaged. It has not been apparent that sanitary science would greatly advance the art of healing or the science of therapeutics, for which other classes of facts are needed, and for which they have been diligently collected, in times past. Though it is possible that the science of therapeutics might be fostered and advanced by governmental aid, there seems to be no especial need for such aid so long as it is for the pecuniary advantage of individuals to perfect their knowledge of therapeutics in order to lead in the practice or teaching of their profession. But with sanitary science the case is very different,—there never has been, and there is not now in this State, any class of persons having such an income from any public-health service by the individual citizen as will permit of any effort for the collection of those facts which are essential to the beginning of sanitary science. In the statement just made I do not forget that progress in sanitary science and improved health-service increases the incomes of individuals generally throughout the State; this is undoubtedly true, but it does so by lessening expenditures and by increasing the ability to labor in ordinary and extraordinary pursuits. It is plain, therefore, that we cannot expect much progress in sanitary science without some such associated effort as that afforded by governments—State, National, and local. The old saying that "what is everybody's business is no body's business" is particularly applicable in this connection; for though it is readily granted by every one we meet that "health is wealth," that "public health is public wealth," that "an ounce of prevention is worth a pound of cure," and that measures for the promotion of health are of vital consequence to every person, yet, except the government aids, there is now no person who can get a living by laboring for the prevention of sickness.

HOW CAN A GOVERNMENT PROMOTE SANITARY SCIENCE?

The chief duty of a government is to do for the safety of a people whatever they are unable singly or by practicable voluntary associations to do for themselves. If, as is now known to be the case, people die or suffer in great numbers from lack of knowledge which only the government can collect and diffuse among them, evidently it is one of the highest duties of the government to collect and diffuse that knowledge. That hundreds of such deaths have occurred in this State in every year is now established by good evidence.

WHAT KNOWLEDGE IS NEEDED FOR THE PREVENTION OF DEATHS.

Manifestly the first requisite for the prevention of deaths is a knowledge of the causes of the deaths. This has long been recognized by intelligent legislators, and in most civilized countries "vital statistics" have for many years been regularly and systematically collected. The same is true in many of the States of this Union. The history of progress in public-health movements shows that sooner or later the facts thus collected usually lead to some organized work for the prevention of deaths; thus in England Annual Reports by the Registrar General, relative to vital statistics have been published since the year 1838, while Reports by the Medical Officer of the Privy Council date from the year 1858, showing that after the beginning of vital statistics in England, twenty years elapsed before a general Board of Health was established with the view of attempting to systematize the public-health work, and make it more effective. In this country, in Massachusetts vital statistics have been collected since 1842, and in 1869 a State Board of Health was established for the prevention of those deaths which the vital statistics showed to be most numerous. During the twenty-seven years preceding the establishment of a State Board of Health in Massachusetts, the statistics of deaths and their causes had been collected, published, and studied by citizens of that State, and the evidence was conclusive that many deaths occurred from causes known to be preventable, and many more occurred from diseases believed to be preventable or avoidable. In Michigan, vital statistics have been collected since 1868, and the State Board of Health was organized in 1873,—following the first inquiry for facts more speedily than in the older countries, partly because the vital statistics of Michigan soon showed that in Michigan as in Massachusetts, there were many preventable or avoidable causes of sickness and death, and suggested a similar agency for communicating to the people the knowledge necessary to avoid or prevent deaths from such causes. It must not be understood that the vital statistics alone are sufficient to give this important knowledge. It is said that a single bone enabled Owen to construct or reproduce the skeleton and form of an extinct species of animals, and subsequent discoveries of fossil remains confirmed his hypothesis and heralded another of the grand triumphs of mind over the difficult problems with which thinking minds everywhere are engaged. But it was to Owen, the diligent student of anatomy, the close observer of the many ways in which organ is correlated with function, and function with function, the learned teacher of the fundamental laws of structure and of the history and philosophy of structural development, it was to the keen eye and mind of *such* a man, and not to the mere delver in the earth by whose spade the bone was brought to light, that the communicative fossil disclosed its secrets of the past, its vision of the perfect form that should be revealed.

Thus it is not to the mere *compiler of vital statistics* that there is given a comprehensive view of the relations which the various classes of deaths bear to the varying conditions of soil, climate, age, occupation, nationality, social custom, individual habit, and pecuniary circumstances, by which the people of a State are surrounded, and of the various means of prevention or avoidance, direct and indirect, by which it is possible to lessen the death-rate of a State, diminish its burden of sickness, crime, and poverty, prolong the lives of its inhabitants, and promote their comfort, welfare, and happiness.

The man or the body of men who, from its vital statistics, shall construct the public-health service of a State must bring to the task the knowledge which can be acquired only at the feet of the masters of the medical sciences, and in the every-day walks of the physician, the familiarity with the manifold forms and habits of minute organic bodies, both animal and vegetable, which only the biologist has attained, the command of the inorganic substances and forces of nature which is bestowed only in the laboratory of the chemist, the knowledge of the formation and relative position of rocks and soils and of the relations of these to drainage and water-supply which is the reward of the geologist, the knowledge of climate which is the heritage of the meteorologist, the knowledge of the principles of government and of the moral nature of man which characterizes the lawyer, the power of commanding the attention and addressing the conscience of the people which is the glory of the orator and the preacher, these qualifications and *more* are requisite not only to that study of vital statistics which shall discover the preventable causes of deaths, and elaborate practicable means for their removal or control, but also to that successful adaptation of means to ends by which the people shall be led to adopt and enforce practicable measures for their own protection and safety.

USES OF VITAL STATISTICS.

To vital statistics we are indebted not only for evidence showing the necessity of effort for the prevention of deaths, but such statistics are needed for constant reference in studying methods by which the deaths may be prevented. Before we can act intelligently for the prevention of deaths from any given disease or cause, we need to know the time of year at which the danger is greatest, the ages at which a person is most in danger, to persons of which sex the danger is greatest, whether the danger is greater in one part of the State or country than in another, and many other facts. Vital statistics, accurately collected, compiled, and studied, for a period sufficiently long, will give us such information.

WHAT ARE "CONTRIBUTIONS TO SANITARY SCIENCE"?

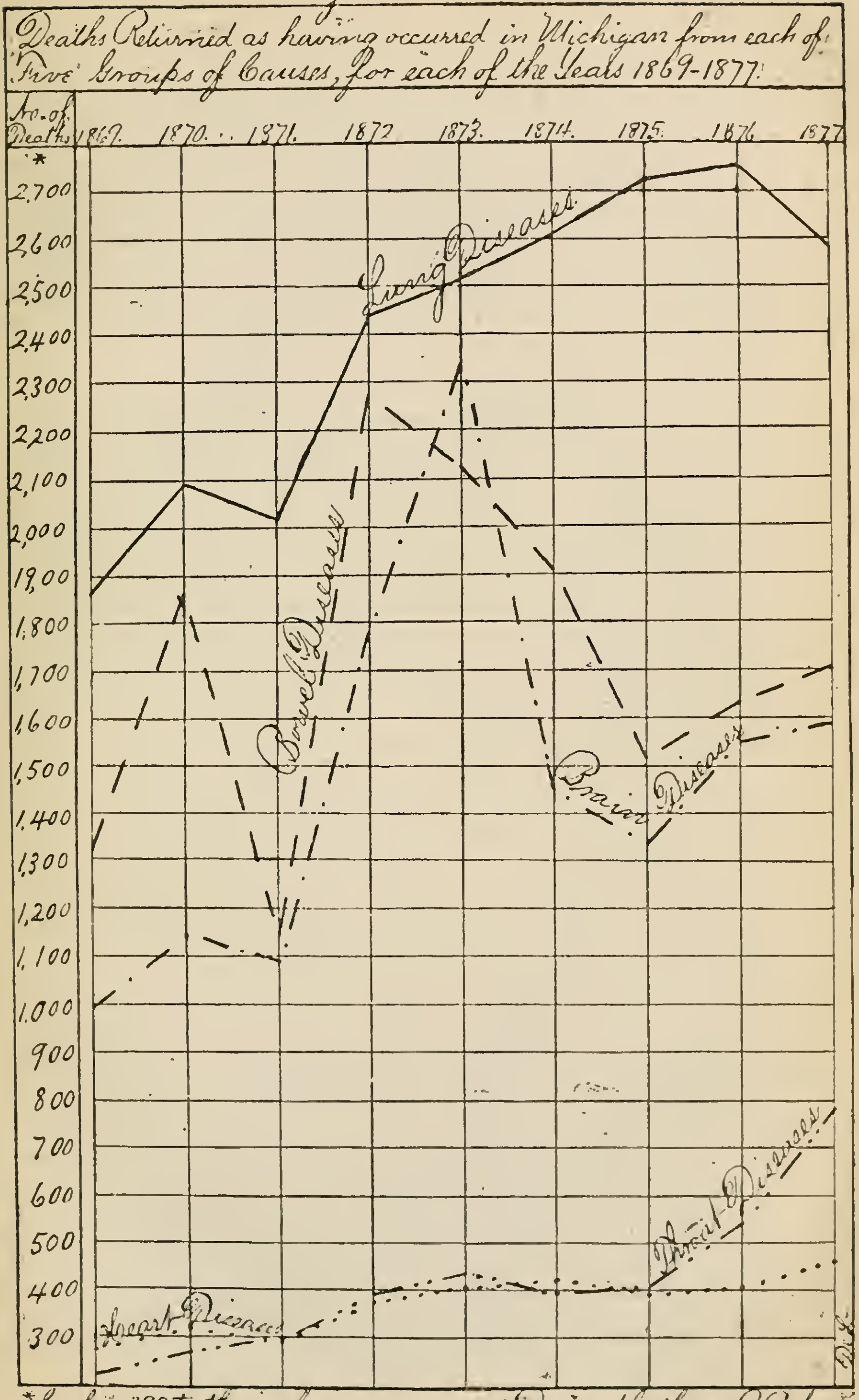
It is, I think, just as important to "know a good thing when we see it" in public-health work as in any other affair; therefore it is well to bear in mind that popular books and articles are not usually "contributions to science," that papers (such, for instance, as this one) read at public meetings are not usually "contributions to sanitary science," and that really valuable "contributions to science" are not commonly easy and pleasant reading, notwithstanding their high value in advancing existing knowledge. A science is built up by the accumulation of numerous facts, which, ultimately, are grouped so as to exhibit general truths. When an individual or a government collects numerous facts, and skillfully groups those facts so as to lead to new knowledge bearing upon the problems with which public-health work deals, that individual or that government makes an important contribution to sanitary science. However useful it is to have essays on public-health work in all its various departments, and however much good may be done because of the stimulus of such essays, which I consider essential to progress in sanitation, yet it must not be forgotten that the real solid basis of all such work must be laid in the patient, pains-taking accumulation of facts (such as physicians are freely contributing), their classification, comparison, collation, provisional grouping, and final grouping so as to serve as bases of action. Thus the recognized basis of sanitary science is statistics, of deaths, of sickness, of meteorological and other surrounding conditions, though very much more than such statistics is needed for an effective public-health service.

USEFUL FACTS FROM THE VITAL STATISTICS OF MICHIGAN.

Facts illustrating the nature of some of the information gained by means of vital statistics already collected in this State, may be given : It has been learned, for instance, that in this State, during a long series of years, the danger from small-pox was not as great as the danger of death from whooping-cough, there being twice as many deaths from whooping-cough as from small-pox (though the proportion of children is greatest among those who die from whooping-cough). It has been learned that diseases of the lungs cause nearly one-fifth of all the deaths reported in this State, and that nearly one-half of all the deaths are attributed to diseases of the lungs, the bowels, and the brain ; and it is found that a large proportion of the deaths from each of these three groups of diseases are reported to be caused by tubercular diseases, such as consumption of the lungs, consumption of the bowels, tubercular disease of the brain and coverings, etc., so that if, as now seems probable, sanitarians shall soon be able to class consumption among the preventable diseases, and to teach people how to prevent a considerable proportion of the deaths now charged thereto, it will be one of the grandest achievements of the century; for it will add more to the financial prosperity of the people than can be easily computed, hundreds of thousands of dollars annually now being lost to the people of this State by reason of sickness and deaths from consumption ; and then the anguish of human hearts beyond any power of computation or expression !

The deaths reported from consumption in Michigan will average over 1,400 annually, and there is evidence that the number reported should be much increased in order to equal the deaths which actually occur; probably two thousand persons die in this State in every year from consumption. And yet compared with many other States Michigan is a very healthful State, and we are accustomed to regard these deaths as inevitable, indeed, as a rule, they seem to be when once consumption has been contracted ; and up to this time no effort has been made to prevent the spread or occurrence of this disease. It may serve to awaken enthusiasm sufficient to start some effort for its study and restriction, if we consider that consumption is now proved to be communicable from man to lower animals; that there is good evidence that the disease may be communicated from animals affected with it to man—as, for instance, to susceptible children by means of milk of a tuberculous cow, to any susceptible person by means of insufficiently-cooked meat of a tuberculous animal; that there are hundreds of tuberculous cows and other animals; and

Diagram No. 5.



Deaths Returned as having occurred in Michigan from each of Five Groups of Causes, for each of the Years 1869-1877.

*Scale = 388 to the inch.

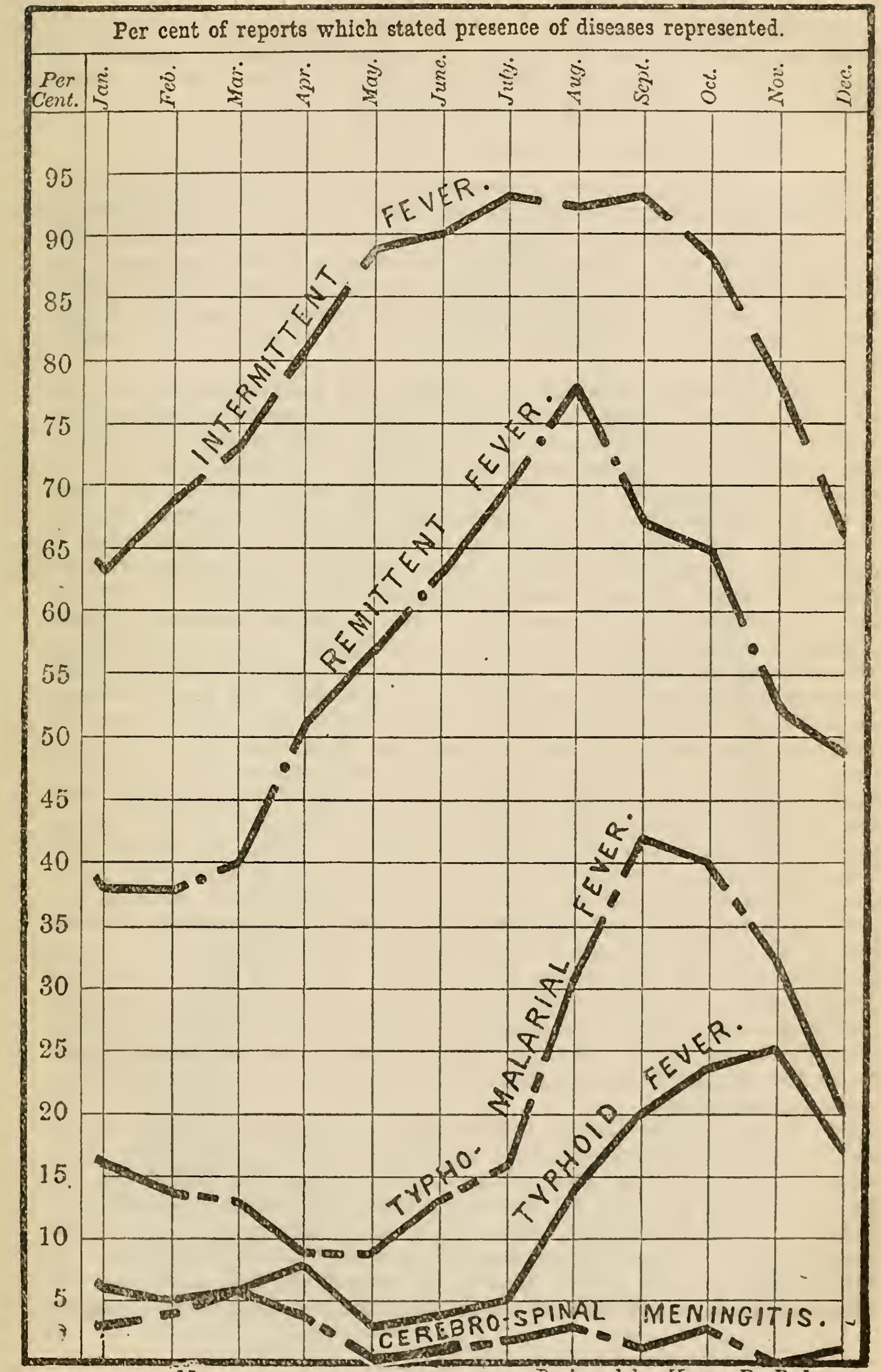
Designed by Henry B. Baker.

that consumption is probably spread among people in unventilated rooms by breathing air which has come from the lungs of persons suffering from consumption. The evidence of this last proposition is two-fold—because from statistical and other evidence some have been convinced of the truth of it, and lately experiments have shown that dogs will contract the disease if caused to breathe air in which tuberculous matter has been atomized. Let us place these facts by the side of those others which the vital statistics give us—namely that counting all children and grown people in this State, at least twelve per cent die from consumption—an average equal to every eighth person you meet in this State; and we may add that the death-rate is reported about double this among persons over fifty years of age; thus we begin to see abundant reason for tremendous effort to learn the whole truth, and then for another effort for the prevention of this great waste of human life, which is going on among us.

THE VALUE OF REPORTS OF SICKNESS.

Until recently sanitarians have been obliged to accept as their best guide in the study of the causes of sickness the facts reported concerning the number, time, and alleged causes of deaths; but evidently there is much sickness which does not result in death but which nevertheless it is very desirable to prevent if possible, and there are many deaths having a remote cause in sickness or other conditions quite different from those immediately preceding the death and likely to be reported as its cause; so that statistics concerning the sickness of a people are no less necessary than those concerning deaths. Weekly reports of sickness also serve to announce to a State Board of Health, outbreaks of communicable diseases, and thus enable the Board to direct attention in various parts of the State where such diseases occur, to necessary measures for the restriction and extirpation of the disease. For such timely work by the State Board a system of prompt and regular reports of sickness is essential. Yet it is only for a few years that the attempt has been made to collect statistics of sickness; and at this time I know of no such systematic effort being made elsewhere for the collection of facts respecting sickness as that by the Michigan State Board of Health. This Board receives weekly reports of the sickness under the observation of many of the leading physicians in this State, about one hundred of whom in nearly as many different parts of the State promptly notify the Board of the outbreak of any communicable disease, and regularly report concerning the relative prevalence of cases of each of the prominent diseases under their observation. This makes it possible for the State Board of Health to send promptly to each locality, documents bearing upon the restriction of any particular disease which occurs, concerning the restriction of which the State Board has gained useful information; provided the State Board has the means to print and to distribute documents in that manner; and such distribution is desirable even if the document has been generally distributed before, because, during an outbreak of a disease, many will seek and gain information relating to that disease, who will not do so at other times. But aside from keeping the State Board constantly informed concerning the health or sickness of the people, the weekly reports of sickness have great value as contributions to our exact knowledge on the subject; because the facts thus reported can be systematically arranged, compiled, and joined with other facts similarly arranged respecting the surroundings of people at different ages and at different seasons of the year, and knowledge may thereby be gained which will eventually enable the Board to tell the people the conditions

DIAGRAM 3 —WEEKLY REPORTS OF DISEASES IN MICHIGAN, IN 1879.



Designed by Henry B. Baker.

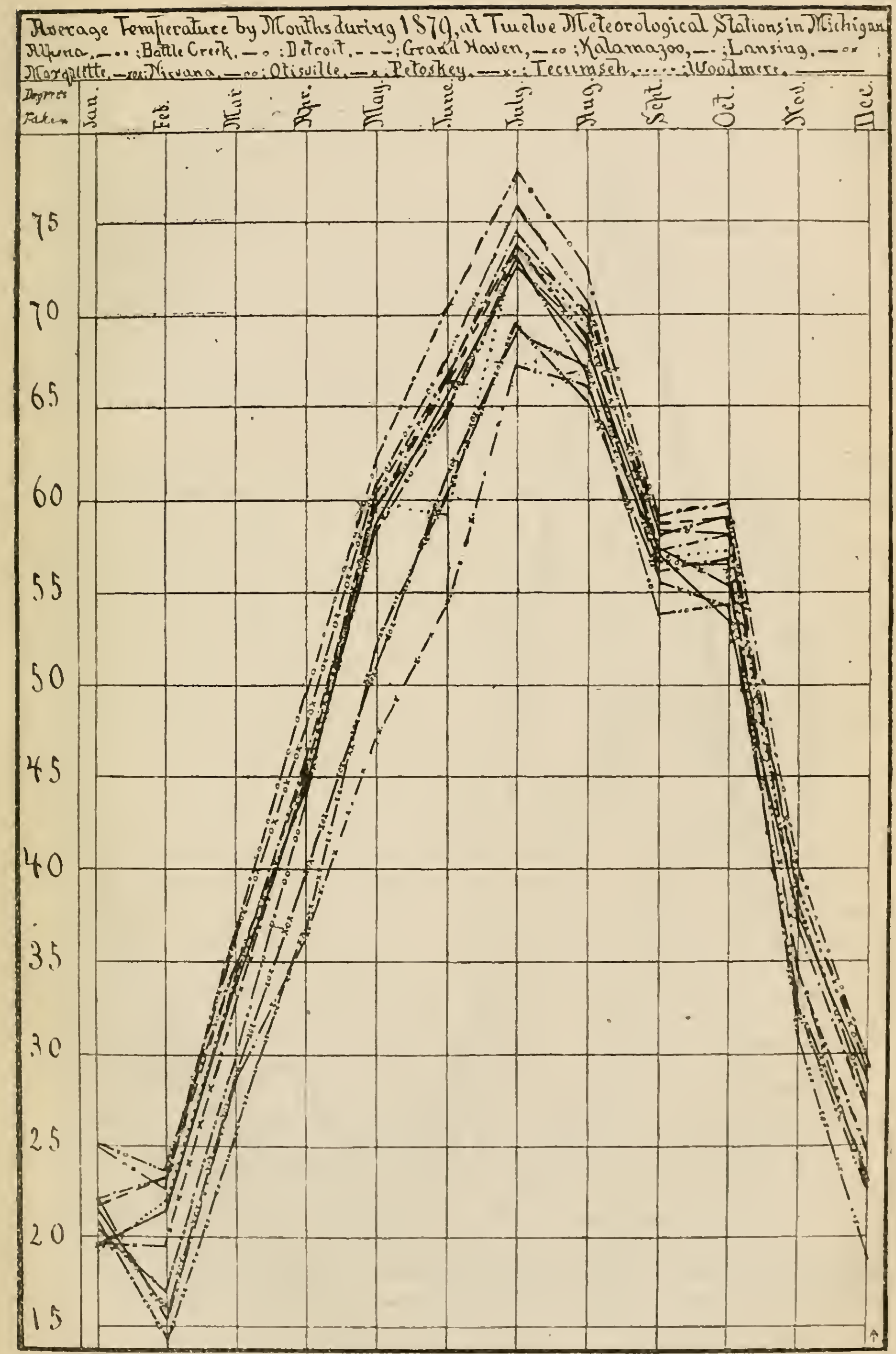
under which sickness from each of the prominent diseases occur, and the conditions under which it does not occur,—knowledge which must be gained if we are ever to be able to avoid or control those conditions which are now permitted to cripple and to destroy so many prematurely.

METEOROLOGICAL AND OTHER CONDITIONS MUST BE KNOWN.

In order to build up a sanitary science which shall serve as a basis for the prevention of sickness and deaths, it is essential, as has already been said, to have facts from more sources than one. It is not enough to know that there are more deaths from inflammation of the lungs in winter, and more from diarrhea in the summer,—we need to know to what condition of the air, what condition of the body, or of its surroundings, the increase of deaths or of sickness is due, before we can consider best methods for changing or for avoiding those conditions.

Only by long-continued watching, recording, and studying the meteorological conditions can we learn whether it is the cold, the absence of moisture, the excess of ozone, or the action of the wind, which causes so many more deaths from diseases of the throat and air-passages in winter than in summer, or whether all these are but indirectly related to the subject and the real cause is—as Dr. A. N. Bell has recently suggested—filth, which can easily be removed or avoided. Yet nothing is more certain than that if systematic effort is made we can learn which of the conditions are invariably coincident with the disease and which are only incidentally present; for notwithstanding the fact that in this State the air is generally cold, dry, windy, and contains an excess of ozone in winter, these conditions do not prevail with absolute uniformity, but sometimes one is absent and sometimes another, therefore sooner or later every one of these and other conditions can be compared with the sickness and the deaths from each of the different diseases which now afflict us, and the truth learned as to whether these relations severally or collectively are those of cause and effect. If individual effort could readily achieve this, I think it would have been done long ago; but when the people of a State collect, compile, and publish the material essential for such studies the work has begun, and in this State such a beginning has been made. From the earliest times it has been known that the weather has much to do with health, but at the time the first State report on vital statistics in Michigan was published (for 1867) the compiler gave only a single table of results of meteorological observations, at the Agricultural College, and regretted his inability to secure results of any other observations in the State. It is only within a few years that systematic observations have been taken for the public-health service of the State, and even now no compensation is given for such important service; but philanthropic persons are now prompted to contribute their labors because the State will compile and publish, and thus render their work available for use in sanitary science.

The State Board of Health now receives contributions of meteorological records from about thirty observers in different parts of the State. Each observer makes records of observations three times each day, namely, at 7 A. M., 2 P. M., and 9 P. M.; and he records the facts relative to temperature, humidity, barometric pressure, clouds, winds, ozone, rain, and snow. As these observers "work for nothing and board themselves," they are not expected to add the figures in the several columns for the months; such labors and also computations of the absolute and the relative humidity, computations to learn

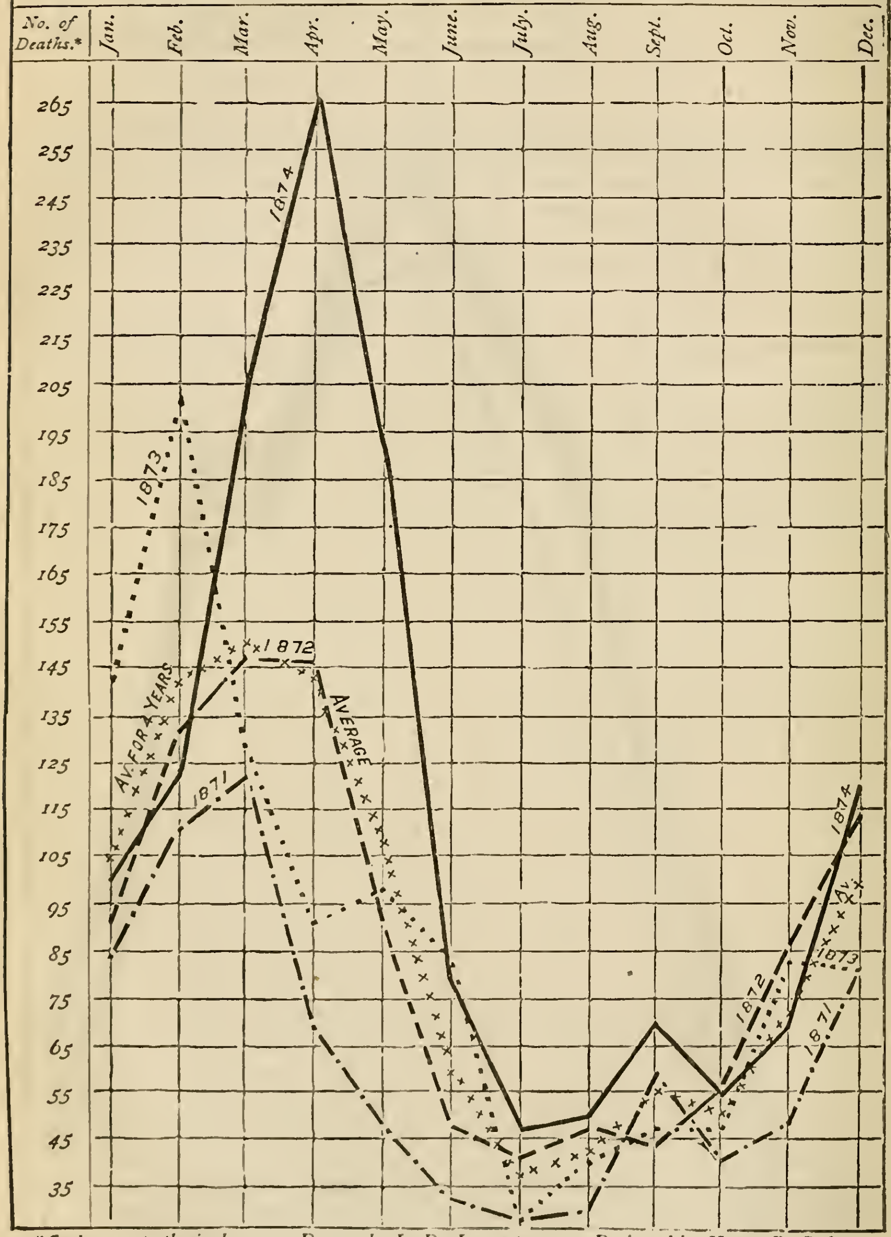


*SCALE, 10 Degrees F. to an Inch, vertically

Designed by Henry B. Baker. Drawn by H. B. Turner & Jno. K. Allen.

DIAGRAM No. 10.

Deaths in Michigan from Pneumonia Corrected for Omissions in Enumerating, Equalized for Increase of Population, and Equalized to Months of Uniform Length, for the Years 1871, 1872, 1873, and 1874, and Average for 4 Years ending with 1874.



**Scale=40 to the inch.* *Drawn by L. De Lamarter.* *Designed by Henry B. Baker.*

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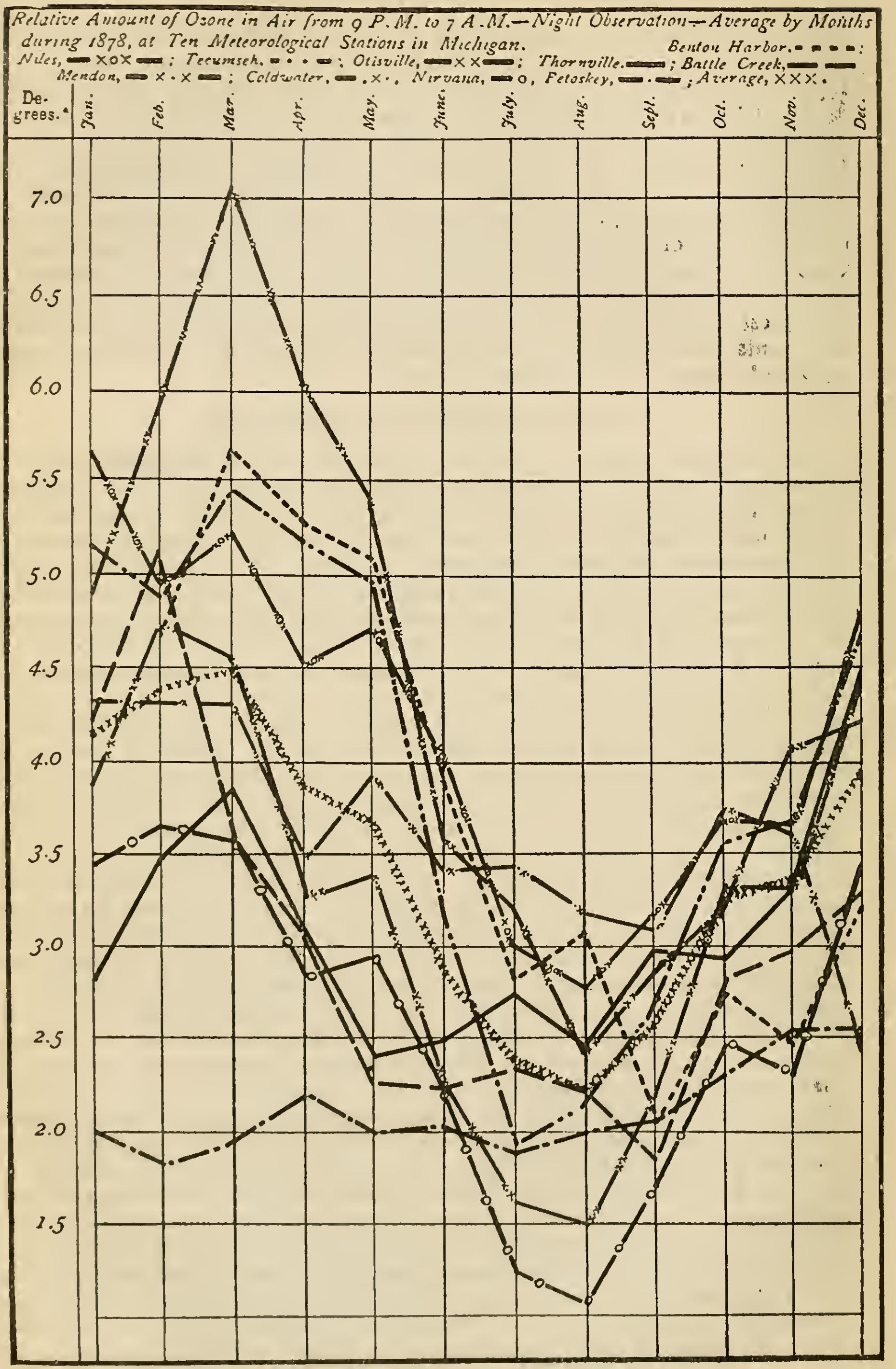
the actual pressure of the atmosphere, etc., are performed in the office of the State Board at Lansing, where also tri-daily observations are taken. The reports of these thirty or more observers, when added, computed, and averaged, are compiled in tables, showing for each locality the average for each meteorological condition which is observed. These tables may be used for purposes of study by any person. In order, however, to prepare in the best manner possible the statements of the conditions of the air, so that they may most easily be compared with statements of the sickness or deaths from each disease, and an estimate made of the influence upon the disease by each meteorological condition, it has been the custom to so perfect the data that it can be represented to the eye on a diagram drawn accurately to scale. Such diagrams are as useful and as essential to the sanitarian as are the profiles which the surveyor makes for "cuts" and "fills" to the builders of railroads and streets, and their modes of construction and use are similar.

DIAGRAMS ILLUSTRATING THIS PAPER.

The diagrams relating to deaths, to sickness, and to coincident meteorological conditions, which have been placed in the hands of the audience, it has been sought to make as nearly self-explanatory as possible. It will be noticed that the years or months, as the case may be, are over the vertical lines and not over the spaces between the lines. The ups and downs of the irregular lines crossing the diagram from left to right indicate the rise and fall of the several conditions or diseases represented for the months or years stated at the top of the diagrams. The degree of temperature, or of ozone, or the per cent of the weekly reports which reported the given disease, is stated, for each different level, in the column of figures at the left. For example, if you will look at the Pneumonia line in Diagram 1, page 121, you will see that in January, 1879, sickness from pneumonia was reported present (at some or all of the localities from which weekly reports were received) on 68 per cent of the reports received for the weeks in that month; in February, by 80 per cent of the reports; then the per cent of cards on which it was reported fell off to 15 per cent in August, and rose again to 51 per cent in December.

In comparing the lines relating to sickness or deaths with those relating to meteorological conditions, it will be noticed that for some diseases the *ups* and for others the *downs* of the line representing the disease uniformly correspond with the ups of the lines representing meteorological conditions. In some cases, therefore (as in comparing the lines for the cold-weather diseases in diagram 1, page 121, with the lines for temperature, in the diagram on page 115), it may facilitate the comparison to imagine the lines for the meteorological conditions (together with the scale on the left-hand margin) reversed with reference to the top and bottom of the diagram, so as to run down in months for which they now run up, and *vice versa*. Many interesting correspondences between the rate of sickness and changes of a meteorological condition may be seen by comparing the diagrams with each other. For instance, by the diagram on page 115 it may be seen that the temperature fell slightly in February, 1879, and by diagram 1, page 121, it may be seen that sickness from pneumonia rose correspondingly; by these same diagrams it may be seen that the temperature rose slightly in October, 1879, and that sickness from pneumonia fell correspondingly. Diagram 10, opposite this page, shows that in several years the deaths from pneumonia increased slightly in September, decreased slightly in October—about the time of our Indian summer—and then gradually rose as colder

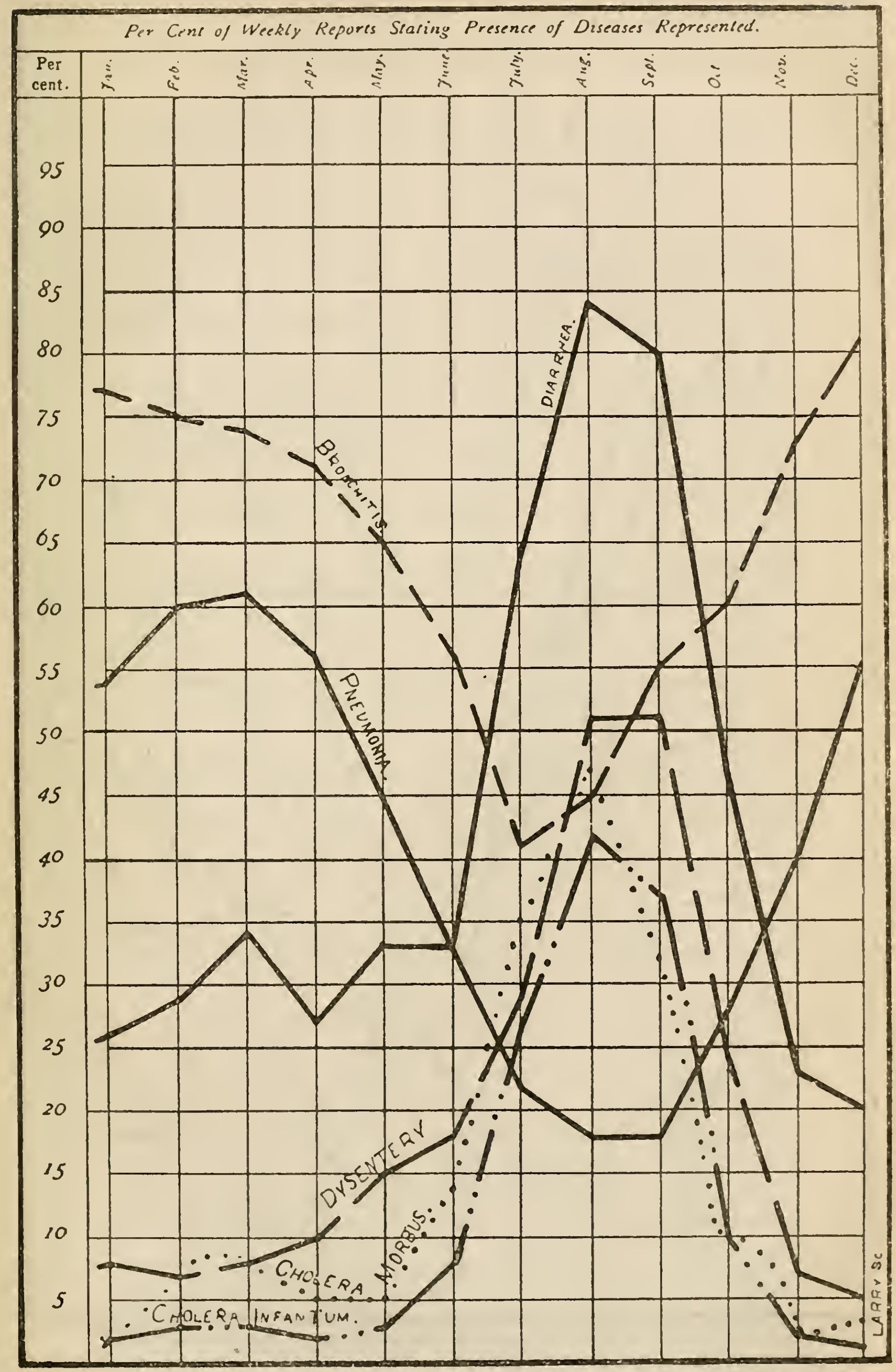
DIAGRAM No. VII.—OZONE, NIGHT, BY MONTHS IN 1878.



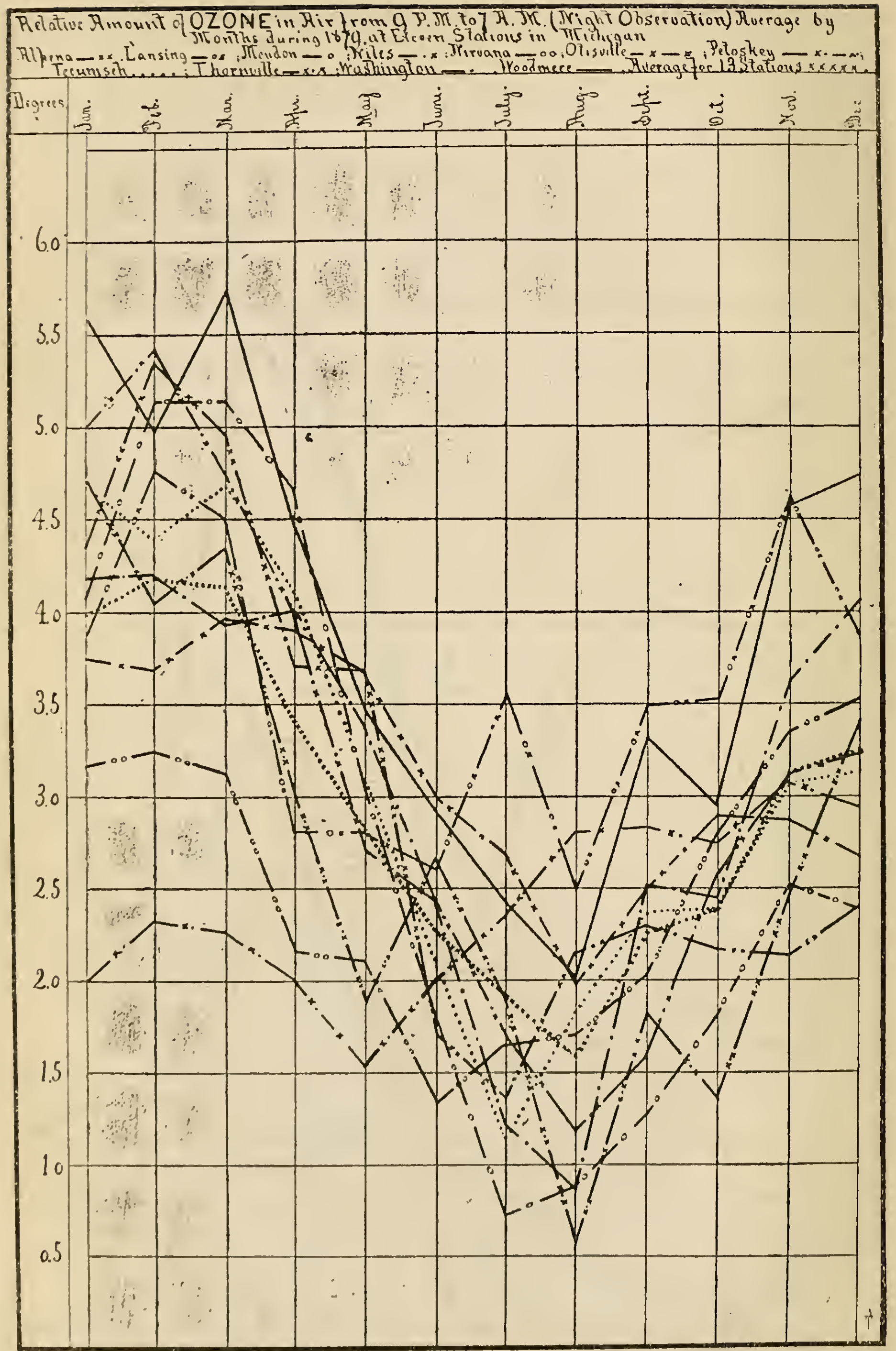
* SCALE, one degree of coloration (on a scale of 10 degrees) to an inch vertically.

Drawn by F. S. Kedzie. Designed by Henry B. Baker.

DIAGRAM No. 1 —DISEASES IN MICHIGAN. BY MONTHS IN 1878.



Designed by Henry B. Baker.

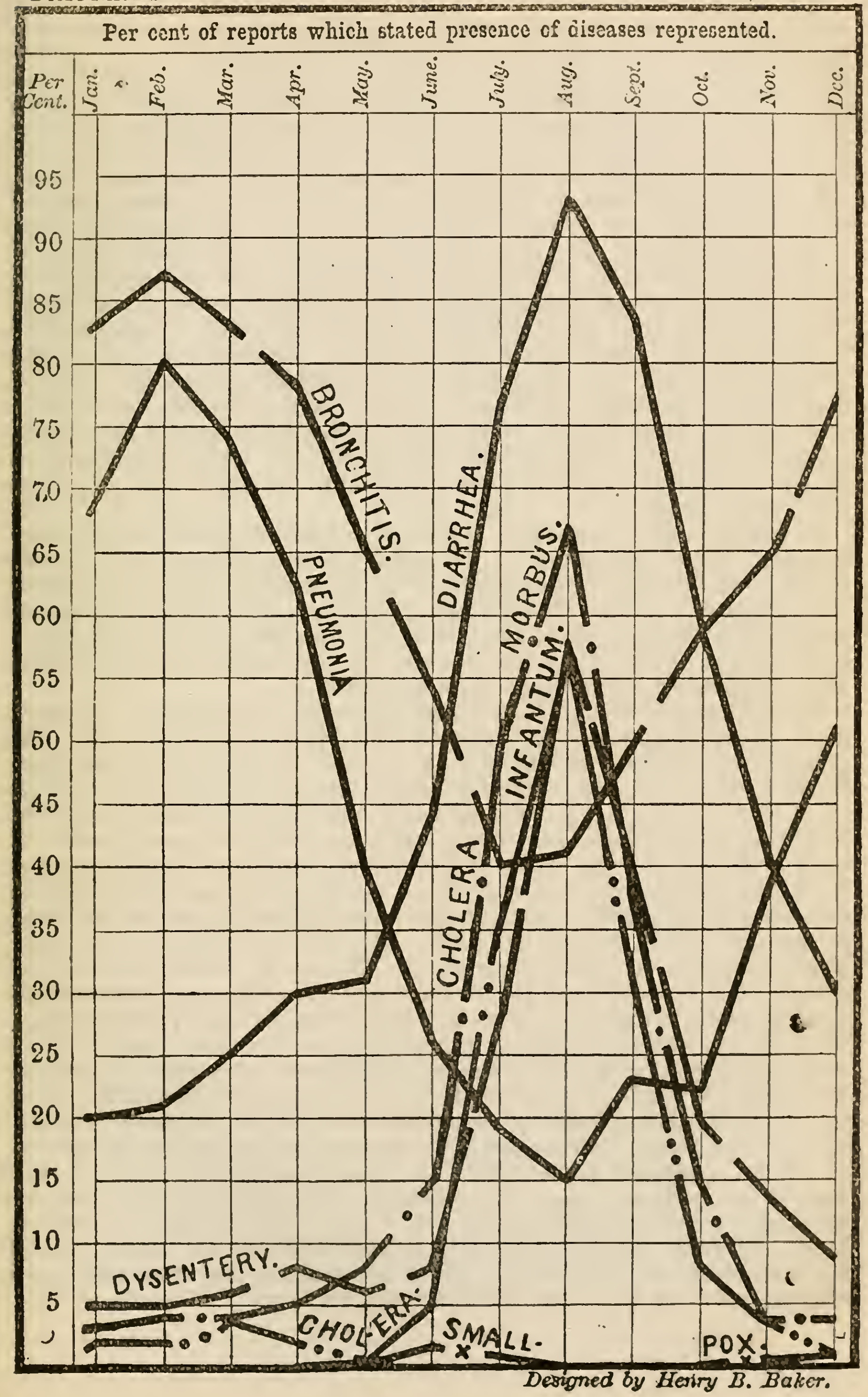


Relative Amount of OZONE in Air from 9 P. M. to 7 A. M. (Night Observation) Average by Months during 1879, at Eleven Stations in Michigan

*SCALE, one degree of coloration (on a scale of 10 degrees) to an inch vertically

Drawn by: H. B. Turner and Jno. K. Allen. Designed by Henry B. Baker.

DIAGRAM 1—WEEKLY REPORTS OF DISEASES IN MICHIGAN, IN 1879.



Designed by Henry B. Baker.

weather set in. Comparing this diagram with the two numbered 1 (pages 119 and 121) it may be seen that the evidence relative to the *deaths* from pneumonia (compiled from returns made by supervisors) corresponds closely with the evidence of *sickness* from pneumonia, as reported to the State Board of weekly Health by the leading doctors in the State. By comparing all the diagrams just mentioned, it is evident that the system of reporting deaths yields valuable data; and the same is true respecting the weekly reports of sickness, for the two diagrams numbered 1, relating to sickness from two strongly-marked classes of diseases, for the years 1878 and 1879,—give substantially the same replies to our inquiry as to months of greatest sickness from each of the diseases represented therein, and nearly every variation seems to be accounted for on referring to diagrams representing the meteorological conditions. In comparing the diagram of temperature (page 115) with diagram No. 1 (page 121), the importance of the evidence of the meteorological conditions is so apparent at a glance as to attract the attention of even the careless observer, but there are even closer coincidences that may not be so readily noticed; on page 118 it may be seen that the line of × × ×'s representing the average of ozone by the night observations corresponds almost exactly with the line representing pneumonia in diagram 1 on the opposite page (119). On pages 120 and 121 are similar coincidences.

By means of such diagrams it is possible to gain information which cannot be gained in any other way; for they enable a person to follow with his own eyes the rise and fall of each disease and of the temperature, ozone, pressure of atmosphere, or other meteorological condition, and to see at a glance whether the rise and fall of the disease coincides with the rise and fall of any condition of the air, or whether there is any constant coincidence such as would indicate a relation of cause and effect.

In the diagrams which I have submitted for your inspection, it is easy to see that very strongly-marked relations exist, as, for instance, between the great heat of summer and the rise in the lines representing sickness from diarrhea, cholera-morbus, cholera-infantum, etc., and between the cold, dry air in winter and spring, and the increased sickness from inflammation of the lungs and other diseases which nearly disappear during the warm months. In order to fix definitely the causes of sickness and deaths, the subject must be studied for periods and series of years and in detail,—comparing the deaths in different parts of the State with the meteorological conditions in the localities, respectively; and it is essential to learn what other conditions besides those usually observed by meteorologists have influence in causing sickness and deaths, as for instance, what are the influences of swamps, etc., upon sickness from intermittent and other fevers, and what relations exist between the outbreak of communicable diseases among children at certain seasons of the year and the general opening of schools at that season of the year. For these latter purposes the State Board of Health in this State systematically collects the facts and opinions from leading physicians throughout the State, who consent to act as regular correspondents of the Board, and make replies annually to printed questions, which replies are usually published in the Annual Reports by the Board, and are thus placed upon record for whatever bearing upon problems in sanitary science they may at any time hereafter be found to have. Thus they are contributions to sanitary science, even though some of the statements are not quite as definite and exact as are those based upon observations made with instruments of precision.

SPECIAL INVESTIGATIONS.

Sanitarians must do more than utilize contributions from meteorology and from each of the other sciences, they must make original investigations, such as will result in the actual creation of knowledge never before attained; this is the grand mission of sanitary science in behalf of human welfare, and for this sanitarians must face up to nature in ways never before attempted by human beings, and must bring back from this search after revelations, portions of that eternal truth which will teach us the way of life, the way of health, and the way of happiness.

What some of the points are concerning which special investigations are needed, it may not be amiss to say a word here. With regard to small-pox, diphtheria, and scarlet fever, three dreaded diseases which afflict our people, the State Board of Health, in common with the leading men of the medical profession generally throughout the State, already know enough to suppress these diseases if the people could be put in possession of the knowledge and would act upon the information, which however is not likely to be placed before them unless the State Board of Health can have the means for this important service. In fact, small-pox is practically suppressed in Michigan to-day, and diphtheria and scarlet-fever, have, in many instances in this State, been stamped out of existence in localities where they have appeared. The way to control scarlet fever or diphtheria is not, as seems to be the opinion of many intelligent people and some physicians even, to wait till the disease has taken possession of an individual and then do something to him to kill the disease, provided that the disease does not first kill him, but to keep the disease out of him from the first by keeping it away from him and him away from it; and to shut the disease into the closest possible quarters and then burn it out or smother it in its most secret lurking places. This is possible, it is practicable, and when all our people join hands to do it, it will be as easy as it is now to keep the wild bears of the forest from our homes; but without efficient local boards of health, and general coöperation by the people, no family can protect itself from either scarlet fever or diphtheria.

With regard to diphtheria, however, there are questions which it would be of use to have decided. We know that the living germs or the poisonous elements which cause the disease are reproduced within the human body, and that in various ways, direct and indirect, the disease is communicated from one person to another, in other words, we know that the disease is *contagious*; whether it is also *infectious*, that is, whether the invisible germs or elements of poison whose presence in the body causes the disease are also sometimes reproduced in substances outside the body, how long they can live (or continue efficient to cause disease) in substances outside the human body, and in what substances they can live and retain their deadly power, are questions the correct and unquestioned answers to which would be of great use in preventing the disease and in destroying its cause. It would also be of service to know what it is that makes some epidemics of diphtheria much more malignant than others, for thus we may be able to substitute mild for malignant epidemics, in some such way as is done for small-pox.

We know that the typhoid-fever poison is communicated by water and by milk; but we need investigations to learn in what other ways it may be communicated, and how it is propagated, whether always in the body or sometimes outside the body, and in what lower animals.

There is much, too, that needs to be known concerning consumption, a disease of which more is said in another part of this paper.

The question of the causation of intermittent fever, or fever and ague, as it is called, which we now know to cause more sickness in Michigan than does any other disease, is still an unsettled question; and while much has been done toward preventing it, by drainage, by cultivation of the soil, and by planting of trees, it would be a great boon to the people of this State if we could know certainly what are the relations of intermittent fever to marsh land, or what it is connected with overflowed land that so greatly favors the disease, what are the conditions both subjective and objective under which ague is certain to arise, what is the specific poison of the disease, if such there be.

CLIMATIC DISEASES MAY BE CONTROLLED OR AVOIDED.

With increasing facilities for travel it may soon be practicable for human beings to gain as much control over their climatic conditions as the wild geese have so long enjoyed; but before this can be realized we must know as much as the geese do,—for they seem to have gained that knowledge which mankind are so slow in gaining, and for the attainment of which I am pleading, namely such knowledge as will enable any person to know the special danger at each age and at each season of the year in each habitable portion of the earth. But, because of the expenses of travel and the many difficulties in the way of periodical movements of the population, I would not be content to stop with the knowledge of a wild goose. There *are* animals which know enough to take care of themselves in warm or in cold seasons of the year, particularly in climates so favorable as that in Michigan; and I see no reason why men may not eventually learn to do as well, if only they will admit the feasibility of so doing, and will devote a necessary part of their energies to this undertaking. In order to accomplish it, however, it seems to me essential that there shall be organized effort, and especially that those whom we elect to apportion the expenditures of the State, in the interest of the whole people and not for the exclusive benefit of local or class interests, shall understand the aims and purposes of the systematic study of the causes of sickness and deaths, and shall recognize those purposes as high and noble.

I hope no one will infer that in this paper all the work of the State Board of Health is mentioned; in view of the many other labors by the Board, and by individual members of the Board, it is my duty to say that this paper relates only to a small part of the work of the Board, a part which less than many other parts has to do with its every-day work at the present time, such, for instance as the dissemination of information already gained; yet it seems to me that it is work which it is absolutely essential to have done in order that in the future progress in sanitary science and service may be possible; and it cannot be done except by thorough coöperation among several classes of people. The purpose of this paper is, therefore, the hope of creating a greater interest in a subject which I deem of vital importance to our fellow-men.

DISCUSSION.

Dr. Bela Cogshall, of Flint, took this occasion to read a letter from Dr. Pietra de Santa, editor of the Journal d'Hygiene, Paris, speaking in high terms of the work of the Michigan State Board of Health.

Hon. Le Roy Parker, of Flint, said:—

Mr. President:—I would like to speak a very few words with reference to what I conceive to be of great importance to the cause of sanitary science, that systematic study which Dr. Baker has referred to in his paper. I certainly wish, not simply as a member of the State Board of Health, but as a citizen of Michigan, that larger facilities were afforded to those to whom the interests of the public health in this State have been intrusted by the people, in order that they might make that careful and systematic study of the causes of diseases and the climatic influences which seem to me to be so essential to a right understanding of the relations of health and disease. There has been a discussion carried to some extent in our State legislature this winter with reference to this peculiar work of our Board of Health. I have taken considerable interest in that discussion, and in the way in which our representatives at Lansing have treated the requests of the State Board of Health, and the recommendation of our Governor, that an additional appropriation be made to the Board in order that it might extend these researches which it has been making.

* * * * * * * * * * *

As was stated in the paper by Dr. Chase (quoting the remarks of Dr. Billings), possibly sanitarians may sometimes carry their views too far and exaggerate; but I do not believe any one who carefully studies into the question of sanitary reform would dispute that one of the most essential points to a correct understanding of the relation of health and disease is, that we shall inform ourselves fully as to the nature and prevalence of various diseases. It is important that we should understand the relations between climate and the prevalence of diseases; and this can only be ascertained by the system of information which has been carried on by the State Board of Health. The observers who are willing to take these observations (which in some instances require to be taken three times a day), and report them to the Board deserve credit. It is a grand idea for any observer to give his services to the people of this State, and I do not believe that the people will be so ungenerous as to ask the professional and scientific men to perform this work for nothing. We think if the people once understand fully the importance of this sanitary reform, that those who contribute to this work of public health, will be paid for their efforts. I desire to give my approval, and to say it is necessary for an increased appropriation in order that these observers may further carry on their observations that we may have better information in regard to the meteorological conditions of the State as related to the diseases prevailing in the State.

Rev. D. C. Jacokes, of Pontiac, said:—

Mr. President:—I have no complaint to make about the people of Michigan. There is too much intelligence in Michigan to do intentional wrong on these great questions. I have found if you give them the information the people of Michigan will do their duty. The fact is, there is but very little popular, correct information on sanitary subjects. Let us have all the information we need. I need it, you need it. How do we get that information? This kind of information always comes from learned bodies, which the national people do not understand. We want this Board to bring the desired information directly before the people. I listened with a great deal of interest to my friend, Dr. Baker. The doctor says he has stated to you only a portion of the work performed by the State Board of Health. I am very glad that there are Reports of the Board here that you may take home with you. I hope the ladies will read them. It will tell them with a tremendous emphasis whether a man can live over a filthy cellar with his wife and children (fortunately the man is generally out of doors) and be healthy. You will find facts enough to convince you that it is impossible. I am proud to see so many of the good people of Battle Creek here.

THIRD SESSION, WEDNESDAY MORNING, AT 9:30.

The first paper of the session was on The Sanitary Relations of a Single Point in the New Physiology of Alcohol, by A. F. Kinne, M. D., of Ypsilanti.

THE SANITARY RELATIONS OF A SINGLE POINT IN THE NEW PHYSIOLOGY OF ALCOHOL.

BY A. F. KINNE, A. M., M., D., OF YPSILANTI.

Mr. President, Ladies and Gentlemen of the Sanitary Convention:

I have accepted the invitation of your committee to read a paper before this convention, with a good deal of reluctance; for the time for preparation was short, my subject is an old one and a very badly worn out one, the month of March is, in my profession, a very busy one, and this audience is too learned and intelligent and critical to be satisfied with anything common-place or merely sensational; but if you will be kind enough to give me your attention, I will do the best I can. I am not sorry, however, that my audience is of so high a character by any means, for such men will not only be critical, but appreciative as well. Intelligent, thinking, and progressive men will be my best auditors. Such men I especially desire to address, and if the views which I shall endeavor to present can be accepted by only a few such men as I have the honor to address upon the present occasion, we may feel sure of their ultimate success.

But I am not about to deliver an ordinary temperance lecture. Concerning the entailments of alcohol I shall not have much to say, and not much about the alcoholic beverages, for these beverages are all of them mixtures,—possibly in some cases combinations,—either natural or artificial, and hence, while in most of them the alcohol will be alcohol still, it will be alcohol and something else, and the general effect will be modified accordingly. When, therefore, we would study the true physiology of alcohol, we must take the pure chemical, the distillate alcohol, by itself.

It is important for us to understand, however, as sanitarians, that there is practically no difference between the beverages and the chemical, and, especially, that the former do not differ essentially among themselves. In all of them the alcohol is the predominating ingredient, they are all intoxicating, and the main point always is, what amount of alcohol does the article in question contain.

On this point there has been a great deal of special pleading. One writer criticises temperance reformers for "condemning wholesale about everything that *tastes* good." Another claims exemption for the undistilled liquors, especially the wines, on the ground that these "commend themselves by their rich color, their agreeable odor, and their delicious flavor." Of course, the the sensible properties of the wines and brandies are all right. It is the old story of poor Tray. These fine and rich qualities are only to be cudgeled for being found in such wretched company! The grape is one of most luscious of fruits, and its juice is a delicious beverage. But unfortunately it will not keep. In the ordinary temperature of a grape-growing country, decay, as indicated by the escape of bubbles of carbonic acid, commences within a very few hours. But this decay does not attack the grape juice as a whole, the fermentation is confined to its diastase and its sugar, while the rest of the liquid, its delightful perfume, rich color, and delicious flavor, are unaffected. These choice qualities, then, belong not to the alcohol that is generated, but to the grape. To an article that puts forth such preposterous claims as alcohol does, we cannot afford to yield anything more than is justly due.

There are many other points upon which it would be interesting to dwell, but within the short time at the disposal of this convention, we must confine ourselves to a single question: Does alcohol possess the two opposite natures usually ascribed to it? It is a narcotic; upon this point all are agreed. When freely given it paralyzes the nerves of sensation and motion, the consciousness, and last of all the nerves of organic life,—and this is death. Is it also a "powerful, diffusible stimulant?" and if it is not, can it be shown to the entire satisfaction of reasonable men, that it produces its quasi-stimulating effects, which it is freely admitted are apparently very decided, by operating as a paralyzing narcotic?

Upon this question, it is fair to say that the authorities are not quite in harmony. All writers upon the Materia Medica and all the text-books now in use, as far as I am acquainted with them, agree in saying that alcohol, including all the alcoholic beverages, is a powerful diffusible stimulant; that it excites the whole system, renders the pulse fuller and more frequent, raises the temperature of the body, gives energy to the muscles, and exalts, at least temporarily, all the mental faculties.

On the other hand, we find William Cullen, who wrote his work upon the Materia Medica more than a hundred years ago, holding about the same opinions as to the properties of alcohol, as those which we hold. But there is now this important difference: what, in the time of Cullen, was only a doctor's opinion, can now be demonstrated. Cullen puts wine and alcohol, under one title, into his catalogue of the "*Sedantia,*" along with the rest of the narcotics; while in his catalogue of the "*Stimulantia*" these are not to be found. He freely admits its seemingly double and contradictory character, but puts it down as a "narcotic sedative," and concludes in the next paragraph with these remarkable words:

> "That alcohol is such can hardly be doubted; as, when only diluted so much that it can be swallowed, it shows the inebriating, intoxicating, and narcotic effects of other sedatives. When taken in small quantity and much diluted, it does not, indeed, immediately show its sedative power, but on the contrary, it may appear as a stimulant, cordial, and exhilarating liquor. As these operations, however, are in common to it with opium and other narcotics, they do not contradict our opinion of its proper sedative nature."—Cullen's Mat. Med. Phila. Ed., 1808, Vol. 2, p. 181.

But at the present time, opium is called a stimulant, and a stimulating nature is attributed to all the narcotics that are capable of an exhilarating effect, and this seems to settle all the difficulty. But, indeed, it does not settle it. There has been here a great and misleading perversion of terms. We must go back a century and a half and use the terms "stimulant" and "sedative" as Cullen used them; for the exhilarating narcotics are not capable of stimulating the vital functions, the animal passions for instance, or of elevating the vital temperature, or of invigorating either muscle or brain, —except in appearance.

As a medicine there is no reason why we should not concede to it all the value that has ever been claimed. The questions to be settled, relate to its essential nature and mode of operation; and it is quite possible, that in any event, it will still continue to be called a stimulant. But where, meanwhile, if it is not such, will be our skill in the use of terms?

A crowbar may be used to drive a refractory mule with, and it will be a stimulant if it does the work of a stimulant, but when the same instrument is used to remove a stone out of the way of an advancing wheel, it is not a stimulant, although it facilitates progress, it is only a crowbar.

It is a common opinion that alcohol makes the soldier more courageous, and that it stimulates generally all the animal passions and all the vicious propensities. An improved physiology teaches that it is only a narcotic and that its paralyzing influence is elective. In other words, that, like the rest of the narcotics, it paralyzes all the different nerves of the organism, including, of course, all the moral and intellectual faculties, in a certain order, and always in the same order. The soldier is not any braver; the drug has paralyzed his sense of fear. The drunken man is not more profane and obscene, or murderous, or licentious, or vicious in general than the evil nature that is in him. The difference is, that the narcotic has paralyzed his better nature, which resides in the brain, while his animal faculties, which reside in the organic system of nerves, are, as yet, unaffected. He is no worse a man in his cups than he was before; but for the time being his modesty, his decency, his sense of right and wrong, his fear of consequences—all the faculties by which his conduct is regulated—are more or less under the influence of the narcotic, and his baser passions and propensities are left to have their way with him unrestrained. But we will understand this better as we proceed.

The physiology of the two descriptions of nerves, the cerebro-spinal nerves and the sympathetic nerves, here referred to, is not new. Their existence and their relations to each other, and their different functions in the economy of life, were demonstrated by Bernard as long ago as 1869. We find them running side by side everywhere in the body. They are the telegraph wires of the organism, over which messages are sent from organ to organ, or, more truly, from ganglion to ganglion, throughout the whole system. These ganglia, which under the dissecting knife are simply little masses of nervous matter, are the telegraph stations; and the vitality subdivided, "distinct like the billows, but one like the sea," are the operators. But unlike an ordinary electrical wire, a nerve carries messages in only one direction, and transmits only one kind of nervous influence, and is incapable of doing anything else. And hence the necessity for a somewhat complex system of nerves of different kinds, each doing its own work and subserving its own purpose, in the animal economy. As a familiar illustration, suppose I take into my mouth a little food. There goes at once to the salivary glands, a dispatch for the saliva that is needed for its proper mastication. This is sent to the brain by the nerves of taste, and is reflected thence by the cerebro-spinal nerves, which, with reference to their function, are called also the vaso-motor nerves. Presently, the call being satisfied, another dispatch is forwarded to that effect, and the flow is suspended. This checking and regulating influence is conveyed by another and different set of nerves, the sympathetics, which, in like manner, are called also the inhibitory or regulating nerves. This view of the action of these nerves, though correct enough as far as it goes, is doubtless an imperfect one. For reasons that will be obvious to any one who will take pains to look into the matter, the properties and functions of the sympathetic nerves have never been so successfully studied as those of the other nerves. But this at least, and enough for our present purpose, is well understood; the healthy presence and reciprocal influence of both these kinds of nerves are indispensable to the processes of organic life in every part of the body.

We get proof of the existence and different offices of these two kinds of nerves, and at the same time obtain a very interesting view of the true nature of the chemical itself, when we study the action of alcohol upon the nerves of the heart. Take this fact: If you give a little alcohol, the smallest quantity capable of producing an appreciable effect, that effect will in all cases be a quickened action of the heart. There is, then, a nerve in the heart that is more susceptible to the influence of the narcotic than is any other part of the organism. Then take another fact. When a very large quantity of alcohol, sufficient to produce a fatal result is swallowed, it has always been observed that after every other part of the body is dead, the heart is still beating on, and is the last of all the organs to succumb to the paralyzing influence of the drug. Here, then, are two nerves in the heart which, as regards the action of alcohol upon them, are very different indeed. The one which yields up its life to the narcotic so very reluctantly must be a motor nerve; it cannot very well be anything else. And we must conclude that the other nerve, the one which is affected so very easily, is an inhibitory or regulating nerve.

And now let us turn our attention to the alcohol itself. Shall we say that in a small dose it stimulates the vaso-motor nerves of the heart, and that in a large one it has an opposite nature and paralyzes these very same nerves? If you say yes, then why cannot some one tell us at what point in the timing and dosing this change of nature takes place? To say the least, it is not likely that the drug possesses any such double and contradictory nature. And fortunately we are no longer obliged to believe that it does, although the evidence in favor of this view is very strong. The true state of the case is this: The alcohol is a narcotic and paralyzing agent all the time, whether in a large dose or a small one—both when it quickens the heart's action and seems to stimulate, and when it overwhelms and fatally poisons the entire system. But true to its elective nature, which has already been referred to, it paralyzes the inhibitory nerves of the heart first, and the more frequent beating of that organ which immediately follows, is due to the fact that its motor nerves are no longer checked and regulated. And this is the whole of it, though it is by no means all we shall have to say. This simple explanation solves the riddle of alcohol and settles the question which has puzzled the wisest of men in all the ages. But we will subject it to a still further scrutiny.

The elective nature of alcohol is a trait of character which it possesses in common with all the narcotics of its class. Let us look at a few examples, for instance, Belladonna, or Deadly Nightshade. The part of the body most sensitive to the influence of this narcotic is the eye. The instillation of a minute quantity of its active principle, atropia, paralyzes a certain nerve, and the result is a dilatation of the pupil. This effect is a familiar one and a curious one and will pay us for a moment's attention. The iris is made up of two distinct layers of muscular fibers. There are circular fibers for maintaining contraction of the pupil and transverse or radiating ones for its dilatation, and these mutually act upon and counteract each other under the stimulus of light. The circular fibers receive their nervous influence from the oculomotorius, which is a branch of the third pair of cranial nerves and a motor nerve. The transverse fibers on the other hand, are supplied from the ophthalmic ganglion with a sympathetic nerve. The action of the muscular fibers of the iris, both of the circular and of the transverse is involuntary, like that of the muscular substance of the heart. But unlike alcohol, belladonna paralyzes the motor nerve first, leaving the pupil to be immovably dilated by the uncounteracted influence of the sympathetic.

Any narcotic, therefore, which paralyzes the inhibitory or regulating nerves sooner than it does the motors, will make the heart beat faster, and any narcotic that paralyzes the motor nerves before its influence reaches the inhibitories will produce dilatation of the pupil. Chloroform is another instance of the former kind, and stramonium, or thornapple, of the latter.

Alcohol reddens the face. When fully developed, this effect, among tipplers, is called "the flush of wine," and has always been regarded as evidence of the stimulating power of the drink. In fact, it is only a proof that these beverages are poisonous. No true stimulant was ever known to produce a heightened color even. While on the other hand, the flush produced by some of these poisons, notably the deadly nightshade and the thornapple, is more distinct than that of alcohol.

Alcohol is an exhilarant, and as such stands at the head of the list. Some of the alcoholic beverages may have other qualities far more choice and rare and valuable than this, but this alone is indispensable. This is their enticement and their charm, and in this quality also resides their terrible power to deceive, mislead, and destroy.

And this exhilarating power of alcohol has always been regarded as proof of its power to stimulate; but do not let us be misled by mere definitions. Here are two remarkable facts: (1.) The true stimulants which cheer cannot be made to intoxicate by increasing the quantity taken. (2.) A number of the narcotic poisons are capable of exhilarating, the same, except in degree, as does alcohol, and some of them are habitually used for that reason.

But if we confine our attention to its effect upon the action of the heart, our view of the elective paralysis of alcohol will be an incomplete one. We must follow these accelerated blood-currents on to the ultimate tissues of the body, the flesh, which they are intended to nourish, and study there the influence, which this elective paralysis of the sympathetic nerves seems to have upon the capillary circulation and upon the processes of waste and repair. The phenomena to which we refer are most conspicuous, as seen in the face; there we must have already seen them, and there we will now proceed to study them.

And we are now prepared to make what will probably be regarded as the most important announcement of this paper: *The very same appearances and effects, which the use of the alcoholic beverages produce in the face of any one, can be produced by the simple experiment of dividing the sympathetic nerve that runs to the face and furnishes that part with its influence.*

The reference here is to Bernard's well-known experiment of dividing the sympatheic nerve in the middle of the neck of any one of the warm-blooded animals, for instance the rabbit. (See the original French, or, more readily, perhaps, Dalton's Physiology, Sixth Ed., Philad., 1875, pp. 589–592.) The whole account is too long for this paper, but the importance of the subject will justify us in quoting a few sentences. The effects and appearances resulting from this experiment are of three kinds, "all intimately connected with each other."

"First, the quantity of blood circulating in the part is increased and its movement accelerated. It is not a state of passive congestion, but all the vessels are simultaneously dilated, a larger quantity of blood passes through the capillaries in a given time, and returns by the veins in greater abundance than before."

"Secondly, there is a remarkable elevation of temperature in the affected part." This is very perceptible to the touch, or it can be accurately measured by the thermometer. Bernard found it, in some cases, to reach 8° or 9° F., above the natural, *outside* temperature of the part. But there is no development here of extra heat, there is simply a disturbance of the equilibrium of the circulation, by which the warm blood of the centers of the body is transferred, in abundance, to the outside.

Thirdly, the blood goes through the capillary vessels without its usual and healthy change of color. It goes into the tissues arterial blood, and goes out of them into the veins nearly arterial blood still. Cutting the sympathetic nerve, then, has paralyzed the control which that nerve exercises over the size of the capillary vessels, and has suspended also the processes of waste and repair. In other words, the color of the venous blood shows that the rich nutriment which the arterial blood contains has not been taken out of it and built up into the tissues, and that the worn-out substance of the flesh, the waste of the part, has not been taken down and removed.

And the bearing which this very curious and interesting demonstration must have upon the question of the true nature of alcohol is sufficiently obvious. We have only to compare the face of the little animal, whose sympathetic nerves we have paralyzed by dividing them, and especially its thin and semi-transparent ears, with the face of a person under the influence of alcohol, in order to see that the effects in the two cases are precisely the same; and to see, also, that the effects in both these cases must be due to a similar cause,—in the one case as well as in the other, to a suspension of the vitality of the sympathetic nerves, which the alcohol and the surgeon's knife are equally potent to paralyze.

The necessity for saying that alcohol is a "powerful, diffusible stimulant," therefore, can now no longer exist, since we have shown, with the conclusiveness of a demonstration, that its quasi-stimulating effects are due to its elective paralyzing influence over the inhibitory nerves, leaving certain functions, chiefly mechanical in their nature, to the unchecked and unregulated influence of the motor nerves.

But here is a question which will suggest itself to many minds, and which we will now proceed to answer. Since it appears that alcohol accelerates the capillary circulation and the action of the heart, must it not follow, even though it does its work indirectly, that more blood is carried to the brain, and that it is, after all, a powerful cerebral stimulant?

But we must first know more of the deceitful nature of the chemical we are examining. Here is a man who is shaking with an ague. His hands and feet are cold, his lips are blue and cold, his whole body, whether to the sense of touch, or according to his own feelings, is about as cold as the body of a dead man; but upon putting a thermometer into his mouth, we find that there is fever already present; that the temperature of the inside of his body is higher than natural, and is steadily rising.

Then, here is another man who is well under the influence of some one of the alcoholic beverages. His circulation is accelerated, his eyes are brilliant, his face is red and warm, and, by actual measurement, the surface of his body and especially of his face is warmer than natural by a good many degrees. The evidence, both objective and subjective, is very strong that the alcohol is a powerful heat-generating stimulant. But the clinical thermometer has contradicted and corrected all this to the surprise of the whole world. It is now understood that it possesses no calorifacient power whatever. On the other hand, as soon as a quantity sufficient to produce any change at all is taken, temperature is reduced by it. The surface temperature is higher than natural, as already noted, but it is never raised above 98½°, which is the usual inside heat of the body, and it is steadily reduced, along with the bodily heat generally, whenever the potations are continued beyond the point of complete intoxication; and it is hardly necessary to add that all these points have been settled, by carefully conducted scientific experiment, in Germany, in France, and in England, as well as in this country.

But if alcohol is so capable of reducing the bodily heat, it must be a febrifuge, and the experiments that have been made upon this point by John Bentley Todd, by Binz, Liebermeister, and Socin, and by many others, have been of the highest interest; and the view that it is not contraindicated in fever, but, on the contrary, that it is an efficient remedy, even in the most sthenic cases, though met at first even with ridicule, is now well established.

The question whether alcohol increases the amount of blood circulating in the brain or not, was settled by Dr. Hammond in 1874. (See the Psychological and Medico-Legal Journal, Vol. 1, No. 1, p. 13.) And it was settled in the negative. No intracranial blood-pressure was detected during the stage of arterial excitement, and there was none when the point was reached when the animal's gait was staggering and his movements were uncertain; but when complete muscular paralysis was seen to be present the fluid in the tube of the instrument began slowly to rise; it was highest when the pupils were dilated and the coma was complete, and slowly fell again with the return of sensibility.

This discovery of Dr. Hammond, that the rapid capillary and arterial circulation which alcohol produces, is superficial, *is confined largely to the face*, and does not extend to the interior of the cranium, was quite unexpected, and is very important. It certainly affords the popular idea that these beverages are *true* arterial stimulants no encouragement.

The direction of the blood-currents towards the face, here referred to, is among the most familiar of the toxic effects of the drug, and it has always been a misleading one. These men of florid faces and rotund forms, are, apparently, in the very best possible physical condition. They are the best fed men in the community, and we cannot very well resist the impression that their choice liquors are positively nutritious. But a well fed face is not florid, and a well nourished form is not overloaded with fat. As has been already explained, these men are florid because the venous blood still carries the nutriment, which was intended for the tissues; and they are too fat because their flesh retains too much worn-out matter, and because the alcohol, being a foreign substance, must be burned up first, to get rid of it, and the adipose matter, which is the natural fuel of the body, is thus left behind. The true condition of these fine looking men, therefore, is not what it seems to be. They are not well nourished and they are not strong, and in the presence of severe illness or of a serious accident are known to be bad subjects.

Among the many popular errors with regard to the nature of alcohol, the idea that it is a stimulant of muscular and mental ability is, perhaps, the most common. Alcohol is the chief of the exhilarants, as has already been admitted, but that it is anything more than this there is not a scrap of genuine evidence to show.

Muscular strength can be accurately measured and all observers agree that the uniform effect of the drug upon the muscular system is to weaken, whenever enough is drank to produce any effect. (Cantor Lectures, New York, 1876, p. 118.)

We shall best understand the action of alcohol upon the brain, if we will recall what has already been said with regard to its elective paralyzing power over the mental faculties, and take a few illustrations from common life.

Here is a company of "jolly good fellows," all standing on their feet, their faces red and radiant, and all swinging their arms and talking and vociferating at once. These men have been taking alcohol, and, surely, you will say, it has stimulated them. But if we will attend for a moment to what they are saying, we shall see there is no true brain-stimulation about it. We shall be reminded rather of what Addison says of the difference that exists between the mind of the wise man and that of the fool: "There are infinite reveries, numberless extravagances, and a succession of vanities, which pass through both. The great difference is, that the first knows how to pick and cull his thoughts for conversation, by suppressing some and communicating others; whereas the other lets them all indifferently fly out in words."

The case with these revelers is precisely this: The poison which they have taken has paralyzed their conservative faculties and the talking propensity is running on without anything to hold it in check and regulate it.

Sir Joshua Reynolds having maintained that wine improved conversation, Dr. Johnson replied: "No, sir; before dinner men meet, with great inequality of understanding, and those who are conscious of their inferiority have the modesty not to talk; when they have drunk wine, every one feels himself comfortable, and loses that modesty, and grows impudent and vociferous; but he is not improved, he is only not sensible of his defects."

It is one of the saddest of the entailments of alcohol, that so many men of transcendent genius, the brightest ornaments of the race, have been numbered among its victims, and, by a strange but not quite unaccountable perversion of reason, their best works have been frequently ascribed to their alcoholic drinks. Leigh Hunt, for instance, states that "Don Juan" was written under the influence of gin and water,—leaving us to infer that without such assistance Byron never could have accomplished it. Nothing could be wider from the reality than such ideas, while at the same time there is seeming truth in them. The case is precisely this: The habitual inebriate is, to all intents and purposes, a sick man, being all the time in the one or the other of these two diseased conditions. He is either under the influence of the narcotic, or, the drug having more or less completely spent itself, he is, to a greater or less extent, in that state of nervous prostration that immediately follows; and while he is in neither case quite up to his normal condition, he may, in some instances, come nearer to it in the former state than in the latter, and thus lead superficial thinkers into the error that alcohol is a cerebral stimulant, and that he could never have done his very best without it. Before this is admitted, we have a right to insist that the comparison shall be instituted, not between Byron in the one and Byron in the other of his disordered mental states, but between Byron the inebriate and the same great poet, as he might have been, if alcohol had never laid its leaden finger upon him. Later in life (but not much later, for he died at thirty-six) its effect upon his mind was apparent to all. "Midnight draughts of ardent spirits and Rhenish wines," says Macauley, "had begun to work the ruin of his fine intellect. His verse lost much of the energy and condensation which had distinguished it." (Edinburgh Review, 1831.)

Our own countryman, Edgar Allan Poe, was an inebriate, also; but it could never be said that he drew his inspiration from drink. On the other hand, it was on account of his dissolute habits that he wrote so little. According to his biographer, R. W. Griswold, his "Raven," his "Annabel Lee," his "Eureka," and, indeed, all his best poems and essays, were written during lucid intervals, snatched from his crazy debaucheries, and after his nervous system had had time, in a measure at least, to right itself. Thus it appears, that although it has been frequently and flippantly claimed that alcohol is the stimulant of genius, there is really no valid ground for the assertion.

We have now concluded what we have had to say, and it is much to be desired that persons who are not yet prepared to accept these views, because they are new and strange, or because they are so directly opposed to long-cherished opinions, will try the experiments referred to for themselves. It will not be difficult to do so, and the result cannot fail to be a favorable one.

Suppose, for instance, you measure your muscular strength with a "health-lift," or with a dynamometer, and then take some of the drink in the strength-inspiring power of which you have most confidence, and when you are exhilarated by it and feel as if you could shoulder a large fragment of Mount Olympus measure your strength again. The drink has fooled you, that is all. You *felt* that you was stronger than natural; you *find* that the narcotic has been true to its paralyzing nature, and that you are weaker. Then, after a time, when the drug has spent itself, and reaction (so called) comes on, and you feel weak and prostrated, measure your strength once more. Fooled again. The stuff has fooled you twice. When you felt yourself strong you found yourself weak, and now when you feel yourself weak you find yourself stronger, your natural strength is returning and what you have called reaction is in reality recovery from the weakening effects of the narcotic.

Many questions bearing upon the health and welfare of individuals and of communities will present themselves to the mind of the sanitarian and philanthropist, but upon the present occasion we shall not have time to enter upon this branch of our subject.

One thought is prominent: Alcohol is not the warming cordial and invigorating stimulant that it seems to be, and there is matter of great encouragement in the fact that this essential oneness of its nature can now be *demonstrated,* and need no longer be regarded as a mere opinion.

It is to be expected, however, that these views will make their way slowly, for there is a world-full of preconceived opinion to be met and overcome, and the opposing influences are numerous and immensely potent. But the truth must prevail at last. Its true place is not along with the displays of wealth and luxury upon the sideboard, but in the medicine chest, along with hasheesh, henbane, opium, stramonium, and so-forth, labeled as a POISON.

DISCUSSION.

Rev. T. H. Jacokes, of Lansing, said:—

I simply desire to say that I have a very profound interest in this question of sanitation. In view of the perils which disease brings to the households of the people of this State, I regard it of immeasurable interest that we can learn from authentic sources how to avoid, and how to prevent their approach, and for this reason I desire to say with marked emphasis that I have listened to the discussion contained in the paper presented before us with profound interest. If it can be established within the domain of physiology, and if it is true that the action of alcohol upon the human system is evil, and only evil, it is very important that I should know it, it is important that my children should know it, that the families of this State should know it. If such a conclusion can be established, as I think it can, that alcohol is deleterious and destructive, it is important that that fact should be published to the people of this State. It should be done by the doctors and the ministers of the State, by everybody who should hear of it. Such a process of agitation should go on that it should reach all the people in this State if that be true, so that knowing it, they can both avoid and apply the prevention. I suppose that avoidance and prevention is the very essence of these sanitary movements, and I think the paper is eminently in that direction.

Prof. A. B. Prescott, of Ann Arbor, said:—

I would like to emphasize one other point in the paper of Doctor Kinne's. I was glad that he began with a clear statement of the mixture of alcohol. As a substance, alcohol is always the same in every mixture of liquor, however prepared or wherever you may find it. I think this is the first conclusion that should be impressed more upon the people. Just as true as an apple is an apple, and a half-dozen apples represent those particular apples, though you may mix them up with a basketful of potatoes, or other fruits, they are still apples. So the particles of alcohol are still alcohol and cannot be anything more or less, whether they are in brandy, wine, whisky, or wherever they are found. People are sometimes led into mistakes by this term, "compound of alcohol." It is not in a chemical sense that alcohol is ever compounded. The particles of alcohol are free wherever they are found, whether they are few or many, whether it forms one-tenth or nine-tenths of a liquid; where these parts are placed they are still alcohol. The liquid may be irritant and corrosive, if the alcohol is unmixed, or it may be in so small a proportion as not to be noticed. The painter uses lamp-black. He mixes it up with some linseed oil or turpentine. It is just the same lamp-black. Mix a little of it with white paint or red paint, it does not look like lamp-black, but it is still lamp-black. The particles of it are unchanged though the general effect to the eye may be very much modified.

Prof. V. C. Vaughan, of Ann Arbor, said:—

I would like to express my appreciation of Dr. Kinne's paper. Of course this is a sanitary convention and we are to study sanitary questions, and not therapeutic laws. Dr. Kinne has touched upon the use of alcohol in health only. To answer whether alcohol should be used in health or not. It should not be used. Why? Because its physiological effect is harmful and harmful only. I think the proper way to meet this subject is to teach the physiological effect of alcohol. The first effect of alcohol upon a healthy person is to quicken the circulation. The heart beats more rapidly; the blood is forced to every part of the body, the brain being supplied abundantly with blood by the large blood-vessels from the heart to the brain. He first receives the effect temporarily, but after a short time there is an excess of blood to the brain, and a person under the first impression of alcohol has a quickened brain action, but this is only temporary. He thinks more quickly, speaks more clearly, and many of the most eloquent orations, I have no doubt, have been produced under this effect of alcohol. The second effect of alcohol is, it paralyzes the nerves. The blood, passing along, comes to the surface of the body, draws upon all the internal organs and especially produces an anæmic condition of the brain. Then ideas flow less freely, his relation between ideas is lost, his face is flushed, and he speaks at random. The next effect is paralysis of the nerve-centres. Then the quick transient movement is lost, the motor nerves are paralyzed, the man staggers to and fro, and, in the first stages he recognizes that he is not moving as he should. During the first stages, by an excessive action of the will he can control his movements, but as the brain becomes more thoroughly paralyzed, he loses the power of movement and falls. If we can impress upon the people just what the physiological action of alcohol is, every sensible man and woman will cease the use of alcohol in health. Another point: It is generally taught that the use of alcohol prevents waste. It does to a certain extent. The man who constantly takes alcohol accumulates fat very rapidly Why? Because the food which he takes is not oxydized. It is not used up. The same result is seen where people suffer from some disease, as typhoid fever. As they begin to recover they grow in flesh rapidly. It is the same parallel case with alcohol. There are not sufficient blood corpuscles to carry the oxygen into circulation. The effect of alcohol upon muscular exertion is apparent. Dr. Parkes made some experiments on this. He had eight or ten men to shovel so many cubic feet of dirt without the use of alcohol. Then he caused them to work under the influence of alcohol, and he found that while under the influence of alcohol they started into the work early in the morning, pleased that they were going to accomplish much more work than they had done in the same time previously, but at the end of the day had accomplished only a fraction of the work they hoped to accomplish. The sensibility to do the work was due first to the effect of the alcohol upon the brain, and the result of their not accomplishing the work was due to the effect of alcohol upon animal heat. As to the question whether alcohol is a food or not, I am sorry to see that some of our most prominent writers upon the subjects of food have answered in the affirmative, saying that it is. They look at it in this way: any substance which is oxydized, any substance which disperses in the body, any substance which reproduces force in the body, is a food. Taking this view of the subject, alcohol taken in very small doses during twenty-four hours is a food, but it is not the proper food to take. A food is a substance which adds to the sum total. But are we enabled to do better work and more work by taking such substances, or are we placed in a condition to do less work? My answer to the question, Is alcohol a food? is, that in health alcohol is not a food, and every fact in the physiology of the subject goes to establish it.

Rev. D. C. Jacokes, of Pontiac, said:—

A little common sense will always help us out of these things. I never have known a man when he was real hungry to go to a whisky barrel to get a dinner. I don't believe if he went there he would get it. I never found a man who drank alcohol that can do as much work at my age as I can. I do not know the taste of one kind of liquor from another. I never had a headache in my life. When I was really hungry I did not believe that a glass of whisky would be food.

The next paper was one by Jno. K. Allen, of Lansing, on Personal Sanitary Responsibilities. It is as follows:—

PERSONAL SANITARY RESPONSIBILITIES.

BY JOHN K. ALLEN, OF LANSING, MICHIGAN.

It will not be the province of this paper to present any new facts relative to sanitary science. There are leaders in this branch of scientific work who are revealing sanitary truths to be used by us in daily life, only too fast for us to comprehend and arrange in order in our minds.

But it shall be the province of this paper to attempt to point out wherein the best interests of the public health are *not* subserved by a disregard of the requirements of sanitary laws, rules, and regulations, and how that disregard is displayed by private individuals.

So closely interwoven in their final results are all our duties to fellow citizens, it is almost impossible to classify them, but for convenience in dealing with this subject, three divisions of our sanitary duties, or responsibilities, are suggested. These divisions are,—

First, Our responsibility to the State; or to other persons considered collectively.

Second, Our responsibility to other persons; or to other persons considered as individuals.

Third, Our responsibility to ourselves.

First, then, we will consider our

PERSONAL SANITARY DUTIES TO THE STATE.

There is an undefinable power which prompts us to obey all laws enacted by the legislators of the State for the public good.

Lord Beaconsfield has said: "The health of the people is really the foundation upon which all their happiness and all their power as a State depend. The health of the people is, in my opinion, therefore, the first duty of the statesman,—and I am confident that there is no object of higher importance to engage the interests of society." No one will contradict his statement. Truly, are not the best interests of the State fostered by any law, the observance of which shall make life more secure or of longer duration?

The prosperity of a State is measured by the number of working days enjoyed by its citizens, and any legislation which has a tendency to increase the number of working days, by placing a citizen under more healthful conditions, enhances the public prosperity by a corresponding amount. The legislators have realized this to a certain extent, as is evinced by some of the public-health laws which are found upon the statute books of the State; but that much more should be done is only too evident to those familiar with the public-health service of the State. But, rather than cry for additional legislation, will it not be best to speak of some of the public-health laws of the State already enacted, and in many instances not obeyed by the people?

The law* provides that in every township the township board *shall* be the board of health. There are 1,064 townships in our State, and the law has established a board of health in each one of them, consisting of officers already elected for other duties; but many township officers do not take cognizance of this law and do not perform any of the duties belonging to a health official. The succeeding section* provides that within thirty days after the spring election or township meeting, this township board of health shall appoint a health officer (who shall be a well informed physician where that is practicable), and transmit his name and postoffice address to the Secretary of the State Board of Health. In 1880, of the 1,058 township boards of health 828 paid attention to this law and the remaining 230 clearly violated the law which their own representatives have made. Hence it is one of the personal as well as official duties of every supervisor, town clerk, or justice of the peace of any township in which there is no active board of health, to comply with the law, infuse life and strength into the fully developed *form* of a local board of health and make it perform the functions and offices for which it was created the guardian of the health and lives of the citizens.

If you have not been made one of these officers by the franchises of your fellow townsmen, it is a personal duty, and should be a pleasure, for you to give the board no peace until it performs every duty and takes every precaution which it may to protect you and yours from any source or cause of sickness. The law gives ample power to enable a board of health to throw a complete mantle of safety around you and your family, and should you not make it enforce the law?

Suppose you have risen from the position of a citizen of a township, and thinking you can afford to pay more taxes, have moved into a village or a city. The same duty of keeping up a board of health lies before you, but it is still more grave a duty because the liability of contracting sickness is increased as the number of people gathered together has increased. The law provides that, unless there is a board of health organized under the charter, the president and council of each incorporated village, and the mayor and aldermen of each city shall have and exercise all the duties of a board of health. Your official duties are your personal duties, and if you are a member of a village or city board of health, are such that they demand your most patient, pains-taking, and reliable work. Have you, as an officer of such a board, to deal with an outbreak of any contagious disease, is it not becoming to you as a guardian of the health and lives of your fellow citizens, in all your acts to regard your high responsibility? If a single case of sickness or a death occurs where thorough quarantine or efficient disinfection enforced by you would prevent it, surely you and you alone, are responsible for the sickness or death of that person. If, as a private citizen, you have reason to fear that one of your children will contract a fatal disease while in attendance at a school where the health officer allows children to attend from a family in which there is a case of such contagious disease, is it not your duty to demand that such negligence shall not be permitted, and that every precaution possible shall be taken to prevent the disease spreading into your own and other families?

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* Secs. 1692 and 1693, Compiled Laws of Michigan, 1871, as amended by Act No. 56, Laws of 1877.

You may say that I am wandering from the division of the subject as regards our sanitary duties to the State, but it must be borne in mind that the laws provide for all these things, and it is clearly one of our sanitary duties to see that the public health laws of the State are fully enforced.

If the officers placed in positions of such trust, as members of a board of health, are not faithful in fulfilling their duties, it is our business at the next election to cast our votes for men who will be faithful. It is the custom to measure a person's breach of trust by the number of dollars in which he is a defaulter; let us measure the breach of trust of our health officials by the number of cases of preventable sickness in their respective jurisdictions.

Another provision of the law is, that a health officer shall receive compensation. If you are a health officer, your first duty is to demand reasonable compensation, and if you are a private citizen, it should be a cause for you to blush that your health officer does not receive sufficient remuneration to enable him to put forth his best endeavors in your behalf.

While the duties surrounding a person who is a member of a board of health are numerous, and the duties of the citizen in seeing that the board of health is properly kept up and in working condition are important, still we have other duties as private citizens, which, if we fulfill them, will materially aid the board of health in its labors, and make its work more prompt and efficient.

Chief of these duties is the giving prompt notice of the occurrence of a case of a communicable disease in our families; this notice we are required by law to give. One of the most necessary things a board of health must know in order to control an outbreak of a communicable disease, is the location of *every* case of such disease within its jurisdiction. The sooner such a notice is given to the proper authority, the sooner the chances of communicating the disease from your house are lessened, provided the board of health as well as yourself, takes the necessary precaution. If it be deemed necessary, you should not object to the most vigorous and thorough oversight of your premises, and to the enforcement of strict measures for the abatement of the disease. To be sure it may be unpleasant to be cut off from the society of your neighbors, but if you do not enforce strict isolation in a case of diphtheria, your negligence may be commemorated by a monument over the grave of your own or your neighbor's child.

We have gradually approached the division of

OUR RESPONSIBILITY TO OTHER PERSONS.

Lord Derby once said at Liverpool: "No sanitary improvement worth the name will be effected, whatever acts you pass, or whatever powers you confer upon public officers, unless you can create a real and intelligent interest in the matter among the people at large. * * * Whatever administrative measures can do—and they can do a great deal—they can never supersede the necessity for personal and private care. * * * The State may issue directions, municipal authorities may execute them to the best of their power, inspectors may travel about, medical authorities may draw up reports, but you can't make a population cleanly or healthy against their will or without their intelligent co-operation. The opportunity may be furnished by others, but the work must be done by themselves."

This fact could not well be better stated. In order to have any reformatory movement embrace the whole people, it must first be embraced *by* the whole people. It is well not to be discouraged because this is not done in a year, or even in a decade, but if we all do our personal duty according to the information we possess it will help the cause of public health by just so much. No energy expended is wasted. If any unsanitary thing exists within our knowledge, our first duty is to abate it ourselves if possible, and if not, to at once ask the assistance of the health authorities. Do what we can, ourselves, first, then call on others. If a foul cesspool or a vault exists on our premises, *clean it*. If a mass of decaying vegetable material is in our cellar, *take it out*.

We must remember that the evils of unsanitary premises do not affect our own families alone, but their deadly influences pass beyond our own line into the family of children in the next house, who may be stricken down first, and prove the deadly warning while we ourselves may be spared. We must get over the habit of saying to our neighbors, "Look out for yourselves, I am going to arrange my premises to suit my own convenience," and placing our cesspools, vaults, barn-refuse, etc., as near the dividing line as possible. There is a false sentiment in the hearts of our neighbors which prevents them from resenting such an imposition and complaining of us to the board of health as they should do. If each one of us would honestly try and keep our premises in the most sanitary condition possible, if we would conscientiously try to prevent disease in our own family from spreading into the families of our neighbors, we would then be performing our duties to other persons in a large degree.

This one position of a householder is only one of a multitude where we ought to act with direct reference to the health of others. The duties as a householder in keeping his house and premises in a clean wholesome condition, are the easiest to perform. If by our own negligence a member of our family is taken ill, it is to us the physician looks for pay, and that is a direct argument in favor of keeping our sewer-connections in perfect order, our well-water pure, our ventilation thorough, and our children and ourselves away from the special contagium of any disease.

It is in our business occupations that our sanitary duties to other persons are hard to perform. It is well to have our shop-girls always standing, strictly attentive to business, when a customer enters, but it would induce greater health and comfort to them if, in their unoccupied moments they could sit down. It would make their smiles and ready responses to our patrons all the more hearty if they were compelled to work only a proper number of hours, and in a well-heated, well-lighted, and well-ventilated apartment.

It would indeed be a pleasure if we could enter our public markets and not have our senses of smell and sight shocked by a mass of decaying fish, meat, or vegetables left by some careless huckster. If each butcher and fishman would endeavor to keep his place of business sweet, cleanly, and pleasant to the eye, his personal duty to others would be partly done, and when he placed upon his counters only the healthiest and freshest meats, his duty to others would be largely accomplished. Of course, we all say it is to his advantage in a business point of view to do so, but by our discontinuance of patronage we would help him to a proper sense of duty.

In the management of schools a large and comprehensive knowledge of public-health measures would be very beneficial both to scholars and to teacher. Children, more than grown persons, are apt to expose themselves to unhealthful conditions, and to have personal habits which may, under certain circumstances, endanger themselves as well as others. By judicious teaching and example, an instructor could greatly benefit the little people under his charge. The single point of teaching a child that the sudden lowering of the temperature of a part of the the body will bring on the ordinary "cold," would greatly lessen the chances of that child's exposing himself to those conditions.

All such habits as placing marbles and pencils in the mouth, trading articles of half-consumed food, wearing each other's clothing, etc., should be discouraged and discountenanced. All water-closets, retiring-rooms, halls, play-rooms and grounds, for children, ought to be kept in a perfect sanitary condition. It would be well if the teacher would use great care and judgment in seating children together, where this is necessary. In many of our schools single seats are provided, which are much more desirable. A great harm can be done to a sensitive organization and a pure mind, by placing it in constant communication with a rude, unprincipled child.

The teacher might, unconsciously to the children, make a personal inspection of the scholars, and to those with untidy and uncleanly habits of dress or person give kind directions to "wash and be clean." I was recently informed by a teacher that she had two scholars who were very uncleanly in their habits; so much so as to be disagreeable if present with her. She said she had in vain talked with the children, and had been tempted to send a note to the parents of the children, but she was sure this would give offense. In cases of this kind a bath-room attached to the school, managed by the janitor, would be a capital place to send those boys for a half hour or so.

I have selected only a few of the occupations in which, we who follow them, have great sanitary duties to perform for the good of other persons. Each person, as he names over the occupations of grocer, baker, miller, and many others, at once finds some sanitary duty they could perform which would render his own or his neighbor's life more secure.

It would seem that in what has been said before,

OUR SANITARY DUTIES TO OURSELVES

are treated as fully as our duties to others, and this is true. But beyond these there are duties for us to perform in regard to personal cleanliness and habits which primarily affect only ourselves, and which are all-important and necessary to a perfect condition of the body. It is to be hoped that none of us have gone so long without bathing, that the evil effects of such a practice were forced upon us; although Dr. Kellogg told us at the recent sanitary convention in Flint that a man, upon emerging from a bath at the sanitarium, in this city, said that "water had not touched his back before for forty years." I do not know how this man was affected, but such a course is not to be recommended at least.

There are none of us, I dare say, who do not remember having been deprived of our sleep night after night, until the bad effects upon our general health, and particularly upon the activity of our minds has been noticed. But still we continue this practice in direct opposition to our best judgment. From a work by one of our most active sanitarians in this State, and one who has taken a great interest in this convention, I quote the following: "From seven to nine hours' sleep are required by all persons. The rule should be, retire early, and sleep until rested." And yet knowing this we repeatedly remain up until two or three o'clock, writing, dancing, etc, and *that* when we know that we must be on duty at the morning hour.

Another personal duty which we owe to ourselves as well as to other persons, is the laboring for improved sanitary conditions in public places. Such as better ventilation for churches, school-buildings, halls, and opera houses; the best methods of sewering and draining private premises, cities, and villages; public baths, public drinking-fountains, and public water-closets; the securing of a pure and sufficient water-supply. There is scarcely a public work which does not, directly or indirectly, affect the health of the persons in the locality, and it is our duty to demand that these public works shall be constructed in the most sanitary manner possible.

It would seem that the people would embrace eagerly any sanitary work which would better their condition. But experience shows this is not the case. What is needed in sanitary reform is "an intelligent coöperation" from the people. There must be, too, a moral *force* behind the sanitary precepts, so that when the precepts are learned, there will be courage and determination to follow them. It is impossible to carry on sanitary work where there is only a sentimentalist's idea of it. It is all very nice for us to feel philanthropic, and to comfort ourselves with the reflection that we read sanitary books, and attend sanitary conventions, but if, while we do this, and our foul drain is sowing the seeds of disease, or our child with a sore throat (which may be a mild case of scarlet fever or diphtheria) is attending school and spreading the disease broadcast, surely we are *very* far from the kingdom of sanitation.

In order to act intelligently, we must possess knowledge, and it is our duty to embrace every means in our power to learn of the laws of disease as well as of health, and having done this, it is clearly our duty to put the knowledge gained into early and effective practice. Master the principles of the sciences which are the basis of public-health work, and we will be impressed with the fact that the "possibility of the prevention of death and disease is not the dream of the sentimentalist, but the deliberate conclusion of the philosopher."

DISCUSSION.

Dr. D. C. Hauxhurst, of Battle Creek, said:—

Mr. President:—We need intelligent co-operation before anything efficient can be done in the suppression of disease. In Dr. Baker's paper there was a vast amount of very important matter presented, but the point does not appear there that we must have co-operation, which, of course, will be necessary from the inhabitants of other States as well as from Michigan. We need it in every case and everywhere. It appears that individuals are at the mercy of the condition of things which surround them. We need State control of the matter, and there should be liberal appropriations of money to the work. We need that knowledge whereby all diseases may be suppressed, and in order to secure this knowledge, we need careful and efficient workers, who shall make observations as suggested by Dr. Baker. Before this can be done, we must have money appropriated. We must have men to do the work. The matter can be summed up, namely, that we need State aid, and that of a very efficient kind, before we can suppress these evils.

Prof. A. B. Prescott, of Ann Arbor, said:—

With regard to the preservation of life, we have combinations and organizations in our cities for almost everything under heaven. For every occupation and branch of commerce; for all the principles of law and religion, we have organizations. What is of more importance than health? We have organizations, local, state, and national. The State of Michigan is very fortunate in having such a well-established, vigorous, and competent Board of Health, and we would that every State in the Union had a good Board of Health. We should be glad that now we have a National Board of Health. There are a great many things to come before the Board of Health for their consideration. Here is this question of the purity of our foods, and the adulteration of foods. The Board of Health, from the degree of professional character and special information that it ought to possess, is the proper and the only well-constituted organization to have charge of the considerations with regard to the purity of our foods, and any law regulating adulteration should be placed in charge of the Board of Health.

Hon. Le Roy Parker, of Flint, said:—

Mr. President:—I am glad that this discussion has taken place with reference to co-operation and support of the public in sanitary work. What I conceive to be the beneficial effects of the holding of these conventions is the increased activity in those cities where these conventions have been held. At the first convention held under the auspices of the State Board of Health in the city of Detroit, over a year ago, at that time there was no such thing as an organized Board of Health, and it was more difficult to get health reports from Detroit than from any other city in the State. The largest city in the State, where there should be the most efficiency in regard to sanitary matters, was the worst in these respects, and from it came the poorest reports; but active measures have since been taken, due to the work of the State Board of Health. At the last sanitary convention, held in Flint, good results followed. In the city of Flint, after the convention was held there, two months ago, increased interest was manifested and much greater attention was paid to sanitary matters than had ever been paid before, and the matter has been agitated and discussed whether it was not advisable for us to have a local sanitary association, which should co-operate with our local Board of Health, for the purpose of making still greater advancement in sanitary matters. I hope this convention may be the means of dropping some good seeds here. The National Board of Health, and also the National Board of Trade have taken active measures towards procuring the enactment of a general law providing for the inspection of foods. Our own State of Michigan took some rather advanced steps in regard to the inspection of foods. You will find by looking into our mercantile laws that very ample enactments were passed by our legislature, requiring under certain circumstances the inspection of all kinds of foods, but unfortunately it was left optional with communities whether they would have their foods inspected or not, and consequently the law is often not enforced. Under the laws of our State, every community has the right to have the appointment of those who shall inspect our foods. The law is obligatory, however, whether an inspector shall be appointed or not.

Henry Willis, of Battle Creek, said:—

I think the sentiment of the paper in regard to the promotion of the health of citizens is an excellent one. The civilized man enjoys life far less than the savage. The savage has a greater sense of life in every thing. He can climb a tree, swim in the water, or, at night, he can sleep out of doors without taking cold, and if he is wounded, in a few hours the wound heals perfectly. Everything appeals to his senses: his eyesight, his hearing, etc. We find classes of men, like the lumbermen in the woods, and hackmen in the streets, who enjoy themselves. We see the men of business in our streets with gloomy or serious faces, hardly ever a smile upon them, but go where the hackmen are,—they are always laughing. We take care of our animals, of our horses and dogs better than we do of our wives and our own health. But, we say, we must take care of the animals—men can take care of themselves. This is the sentiment that generally prevails. Look at our railroads. Go to the station in our city,—you see there the trains moving backward and forward on a level with the ground, crossed by streets thickly. Every now and then a man or woman is killed. We do not take care of anybody. We let people take care of themselves. Go to England and there you find people are obliged to go over the track by a bridge, or under by a tunnel. If they cannot take care of themselves here let them die. I do not say that Christian men would wish this, but it seems to me that the American community is in need of an increased sense of responsibility.

FOURTH SESSION, WEDNESDAY AFTERNOON, AT 2:30.

The first paper read was one by Bela Cogshall, M. D., of Flint, on Consumption; Is it a Contagious Disease? This paper was crowded over from the morning session. The paper is as follows:—

CONSUMPTION: IS IT A CONTAGIOUS DISEASE? WHAT CAN BE DONE TO PREVENT ITS RAVAGES?

BY BELA COGSHALL, M. D., OF FLINT, MICHIGAN.

A late writer has truthfully said: "The most important question now engaging the attention of the medical world is the *contagion or communicability of consumption.*" We may add it is one of the most vital questions affecting the well-being of the human race—consequently it is worthy of an important place in the discussions of a convention of this kind. This may be readily understood and appreciated when we call attention to the fact, that according to the statements of our best and most accurate statisticians, one-eighth of the human race die of this fearful malady. Therefore we stand one chance in eight of becoming a victim to this fell destroyer. With these facts staring us in the face we can readily understand that anything which may be said or done in this department of sanitary science that will help to clear up this much mooted subject, or shall tend to lessen the ravages of this disease, will be of the most vital interest to us all, as it will add so much to the longevity of the race and proportionally lessen the annual death-rate.

It is not our purpose in this paper to enter into a minute or exhaustive discussion of the subject, realizing as we do that papers and discussions in a

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[Non-professional readers may read this paper more understandingly if they consider that phthisis, tuberculosis, and consumption are different names for the same disease.]

convention of this kind should be plain and practical, and such that the most humble mind can grasp and appropriate. We shall attempt to give a brief and condensed summary of the most important testimony bearing on the subject, trusting that the discussions which follow will develop and bring out more in detail the many interesting and important points connected therewith.

A few isolated physicians from time immemorial have held to the view that consumption was a contagious disease. Riverius as long ago as 1668 made the observation that members of a family have one after another succumbed to the disease. Contagion he declared to be the "chiefest" cause of phthisis "for the disease is infectious."

"We may observe women infected of their husbands, and men by their wives and all the children to die of the same, not only from infection of their parent's seed, but from the company of him that was first infected." Similar observations have been put on record from time to time since, and yet no general acceptance of this theory obtained, until it was proved by experiments on lower animals that the disease can be communicated. Nor is the matter even yet set at rest, for many able writers and scientific observers contend that the affirmative of the question is not proved.

Villemin, in 1865, claimed to have demonstrated the fact that tuberculosis in any of its products was inoculable. Tuberculous matter introduced beneath the skin of a rabbit or guinea pig produced tuberculosis. This announcement created quite a sensation in the medical world and many able observers rushed into the arena, and so-called "control experiments" were instituted to prove the truth or falsity of this observation. The whole question of the contagion of consumption hinges on its inoculability. If it can be proved that the virus of tuberculosis is a specific poison then the question is settled.

Klebs and Villemin maintain the communicability of tuberculosis by virtue of a specific germ, which Klebs has so far isolated as to render it visible under a power of 450 diameters, and he says it is quite distinct when the power is raised to 800 or 1,200 diameters.

In order to prove the truth of Klebs' assertion that tuberculosis can be inoculated into animals, Schuller and Reinstadler prepared a fluid now known as Bergman's fluid, in which they propagated the bacteria. These bacteria were introduced into the organisms of animals and invariably produced tuberculosis.

"The question whether there is or is not a specific contagium of tubercle as there is of syphilis or small-pox has much of pathological interest. But the paramount inquiry for the sanitarian or physician is, can phthisis, whether specific or not, ever be communicated?"

Dr. Holden obtained in answer to circulars of inquiry two hundred and fifty replies from leading physicians in various parts of the United States. Of these one hundred and twenty-six expressed their belief in the communicability of consumption, seventy-four gave a negative answer, and fifty were in doubt on the subject.

Holden says "Such great lights in the medical world as Galen, Cullen, Heberdeen, Morgagni, Lænec, Andrall, Bright, Addison, Copeland, Drake, Dickinson, Budd, Walsh, Beale, Bowditch, Flint, Stillé, DaCosta, and others hold to the opinion of its communicability."

The evidence which has produced these convictions in so many minds is of the plainest and most convincing character. A man or woman previously in good health and free from the inherited predisposition to consumption nurses a wife, husband, or friend through a fatal attack of phthisis, and then after a few months sickens and dies of the same disease. Who of us have not observed this time and again? We record the following case coming under our own observation in the city of Flint, Michigan, it being in the family of M. B., an intelligent and industrious Irishman, whose family consisted of a wife and nine children, who were formerly healthy and robust. On inquiry we found the family record on both sides free from hereditary disease of any kind. About four and a half years ago, one of the sons, a lad of about fourteen years of age, contracted tuberculosis, and after a sickness of about a year died. Soon after this the father, forty-nine years of age, who had previously enjoyed excellent health, sickened, and after lingering a year succumbed. A year later, Jennie, a young lady of twenty-two years died, after a seven months' siege with this uncompromising enemy of the human race. On December 6, 1880, another member of this strickened household was placed beneath the sod, Alice, a young miss of fourteen summers, after a nine months' illness. All of these cases were well marked cases of tubercular consumption. Some of the other members of the family have symptoms of the disease. Two of the family have removed to Dakota, where we understand they have regained their former strength and are now enjoying good health. We are of the opinion that other members of the family will become victims of the disease unless they remove from their infected house, or the virus is destroyed by thorough disinfection. The following case as reported by Dr. L. G. Bryhn, in a Scandinavian journal, will suffice on this point:

"A tuberculous man married a woman of good constitution and family history. The man died and his wife became tuberculous as well as her sister who lived with the family during the husband's illness. This sister afterwards married a perfectly healthy man of good family history, who shortly afterwards became diseased as did also a niece who lived with the family for some time. One of their children died of tubercular meningitis, and two more show symptoms of the disease. The woman who nursed the first-mentioned man's wife during her illness became tuberculous and died. She infected her sister who died from the same cause; while their parents lived to old age, and there had been no consumption in their families." He gives other striking instances and says he "considers the disease *catching*, especially in the advanced stages," and adds, "this is quite as frequent a cause of the disease as heredity."

Dr. Tappeiner of Neran, in the Tyrol, in a paper read before a meeting of the German Naturalists and Physicians in 1878, says: "All physicians have observed cases of phthisis rapidly developed in individuals who had for a long time attended on patients with this disease, even when such attendants had not presented any predisposition, either individual or hereditary."

The doctor believes that the explanation of the fact is to be found in the inhalation of the expectorated matter scattered in the air by the coughing of patients. In order to test this opinion he made experiments by intimately mixing a certain quantity of the sputa in a little water. He pulverized this emulsion by an appropriate process and subjected some animals to the inhalation of the substance during one or two hours each day for some time. Dogs were selected as they show least predisposition to contract the disease. Three perfectly sound dogs were put into a pen in the Anatomico-Pathological Institute of Professor Buhl, of Monaco. The pen was situated near a window and is closed in all parts excepting above, where it receives the external air through a door. Some sputa was obtained from a phthisical patient, a spoonful of which was mixed in a quantity of water sufficient to make it of the consistency of almond milk. For an hour and a half each day, this liquid was pulverized and thrown into the pen. At the same time for the purpose of studying absorption by the digestive system of the tuberculous matter, two of the dogs were made to swallow a certain quantity of it from the same patient. The five dogs had apparently good appetites, presented neither cough nor diarrhœa, they ate freely, and were cheerful and nimble, without any symptoms of illness, unless a slight wasting and arrest of development. At first view the experiment gave a negative result. But the day preceding the first autopsy, a little finely powdered carmine was mixed with the tuberculous matter, in order to discover how far it had penetrated into the respiratory apparatus. Two of the dogs, subjected to inhalation, and the two which had swallowed the tuberculous mixture were killed six weeks after the commencement of the experiments. The results of the experiments were surprising. The five dogs presented a general miliary tuberculosis of both lungs, of the liver, the kidneys, and in the two that had swallowed the tuberculous matter, it was found throughout the digestive apparatus. The numerous stains of carmine which were seen on the pulmonary surface showed that the inhaled liquid had penetrated into the pulmonary cells. The microscopic examination made by Professor Buhl established in the clearest manner the reality of the lesions.

It has, therefore, been established experimentally, that in the dog a general miliary tuberculosis can be induced from the inhalation or the ingestion of the matter expectorated by a phthisical patient. The possibility of the contagion of phthisis through the natural channels may therefore be concluded. The hygienic and clinical consequences of the experiments are of the highest importance. These experiments by such eminent and careful observers ought to be convincing to any one, of the communicability of the disease. But we have stronger and more convincing proofs yet to offer.

The following striking case reported in September, 1878, in a German journal, is to the point, and must count for a strong argument in favor of the theory here advanced. "The only two midwives practicing at Neurenberg, a healthy little town of one thousand three hundred inhabitants in 1875, were R. and S. The woman S. was undoubtedly the subject of phthisis, with abundant puriform expectoration. In the first case described, Dr. Reich extracted the child by turning. While his attention was engaged with the mother, he noticed that, owing to some difficulty in the child's breathing, the nurse S. sucked the mucus from the infant's mouth, and also endeavored to promote respiration by blowing into its mouth. For the first three weeks the child progressed well, but then its health failed, and within three months of its birth it died of well-marked tubercular meningitis, initiated by symptoms of bronchial catarrh. In May and June following, two more children died of the same disease. These three cases had been attended by the nurse S. Dr. R.'s attention being thus attracted, he found on investigation that between the 4th of April, 1875, and the 10th of May, 1876, seven children in addition to the above three, had died (all within the first year) of tubercular meningitis, although in no case was there any history of hereditary tuberculosis; that all these cases had been attended by the nurse S., while of all the cases attended by the midwife R., not one had died of this disease, nor had any manifested in any way indications of any tubercular form of disease. The midwife S. herself died of phthisis in July, 1876. It was ascertained that S. had been frequently in the habit of sucking mucus from the mouths of infants, and also of kissing and caressing them."

Perhaps the most conclusive experiments are those of Cohnheim and Solomonsen. They introduced tuberculous matter into the eyes of rabbits and invariably found it produced first local, then general tuberculosis. The smallest amount of true tuberculous matter introduced through a linear incision of the cornea into the anterior or aqueous chamber of the eye produced in about six weeks an eruption on the iris of minute nodules, which increased to a certain size, then underwent caseous degeneration, to be followed in the course of a month by a more or less general tuberculosis of the lungs, peritoneum, and various other organs.

Of the greatest significance is the fact that these experiments were undertaken in a spirit of scepticism, as Cohnheim was one of the most pronounced and authoritative opponents of the theory of specificity of tuberculous virus, when the theory was first promulgated by Villemin. They observed that the above results occurred regularly whenever true tuberculous matter was used. After performing these famous experiments, Cohnheim completely changed his former opinions, and is now so thoroughly convinced of the inoculability of the virus, that he proposes to utilize it as a diagnostic criterion of tuberculous products. Harnsell, another famous observer, found that the insertion of tuberculous matter into the anterior chamber of the eye invariably inoculated the iris. The cornea and conjunctiva could moreover be inoculated directly, and in all cases the tuberculous matter inserted disappeared by the third day, and after from fifteen to twenty-three days of incubation tuberculous collections showed themselves.

The fact that these collections or masses were tubercular was proven after the method of the chemist in recognition of the action of poison, that is by insertion into bodies of other animals. Particles were put into the abdominal cavities of dogs and guinea-pigs. The dogs died of suppurative peritonitis. The pigs were kept under observation for three months and then killed, when all the internal organs and the skin were found without exception, to be filled with deposits of miliary tubercles. Cohnheim tried in vain to excite tubercles in the iris by introducing into the anterior chamber portions of non-tuberculous animal tissues of the most varied kind.

Cohnheim concludes, "everything depends upon the virus. We discover at all points the closest analogies between tuberculosis and syphilis. Both require above all things infection and transmissibility of the disease from person to person."

The comparison between these two diseases we consider well put, for we believe no other infectious diseases so nearly resemble each other. Both, it would seem, depend on a specific virus which must reach a mucous membrane or a denuded surface to be absorbed and induce the disease. The first symptoms are local in both affections. Both diseases may be transmitted by heredity, and are usually latent for a time in the system. During this latent stage both diseases impair the processes of nutrition and retard the development of the body.

Professor Whittaker, of the Ohio Medical College, in *Medical Record* of July 24, 1880, says: "While it is true, therefore, of both diseases, that they may be inherited, that is that both syphilis and tuberculosis may affect the ova and spermatozoids, as well as every other organ and tissue of the body; it is also true of both diseases that they are in the vast majority of cases not inherited but acquired. A thorough sifting of the cases will show this statement to be notoriously true of tuberculosis as of syphilis. So soon as the inoculability of tuberculosis is established the fact is also established that the disease is acquired oftener than inherited." He closes his able paper in these words: "The specificity of tuberculous virus is determined in a higher school, and by means more in accord with the principles of science than clinical observation. And the recognition of it clears the field for prophylaxis and opens up a new and more promising *outlook for the therapy of the disease.*"

In the *Medical Record* for March 12, 1880, we find the following abstract of a paper on the tuberculosis due to the inoculation of indifferent substances:

"M. Martin in a communication to the Societie de Biologie some time since claimed that the histological structure of tubercle nodules was devoid of special significance, since inoculation with indifferent foreign bodies produces the same anatomical lesions as those obtained with tuberculous matter. The pseudo-tubercular eruptions thus produced, in no way differ in their anatomical arrangement from the bodies held to be characteristic of genuine tuberculosis."

Martin then sought to determine whether or not the tubercles produced by the inoculation of tubercular matter differed in other respects from those following ordinary inoculations. He found that the tubercles of tuberculosis possessed the property of infection, whereas the pseudo-tubercles lacked this quality. It was ascertained that in a series of consecutive inoculations on different animals, the infective property of the original tuberculous matter was more and more active. In this respect it resembles the virus of septic processes, which Davaine has ascertained to acquire additional virulence, with every repetition of inoculation on a new animal. The tubercles of indifferent substances acted in an *entirely* different manner. No matter how much of such material was employed, the lesions produced were merely local in extent. This was invariably observed. In no case did any tendency to generalizations manifest itself, and not even the neighboring vessels and lymph glands became inflamed or showed tubercular changes.

The non-infectious nature of pseudo-tubercles was best shown by attempting serial inoculations. The second animal subjected to inoculation from the pseudo-tubercular matter of the first, showed scarcely a local lesion, and the third showed no effects at all. It appears, therefore, that in addition to the true or infecting tubercle, there exists a second kind of granulum, anatomically identical with the former, but totally devoid of all specific properties.

Certainly this is another important contribution to our knowledge of general pathology and it corroborates Cohnheim's previous assertions concerning the infectious qualities of tuberculosis. Martin is apparently ignorant of the work of Cohnheim, but this makes his results and conclusions all the more valuable, because they were evidently obtained independently of this German pathologist.

In concluding this portion of our paper we may be allowed to state that our views in the main on this important question are well typified in the following cogent propositions promulgated by Dr. Budd, one of the cleverest and shrewdest clinicians who ever lived:

1. "That tubercle is a true zymotic disease of a specific nature, in the same sense as typhoid fever, scarlet fever, typhus, syphilis, etc., are.

2. "That like these diseases, tubercle never originates spontaneously, but is perpetuated solely by the law of continuous succession.

3. "That the tuberculous matter itself is (or includes) the specific, morbific matter of the disease, and constitutes the material by which phthisis is propagated from one person to another, and disseminated throughout society.

4. "That the deposits of the matter are, therefore, of the nature of an eruption and bear the same relation to the disease, phthisis, as the yellow matter (the stools) for instance of typhoid fever [does to that disease].

5. "That by the destruction of this matter on its issue from the body by means of proper chemicals, or otherwise, seconded by good sanitary conditions, there is reason to hope that we may eventually, and possibly at no distant day, rid ourselves entirely of this fatal scourge."

WHAT CAN BE DONE TO PREVENT ITS RAVAGES?

In order to discuss this important question intelligently, it is necessary to understand by what channels these tubercular deposits reach the system, and how they can be dislodged and thrown off, when they have found a lodgment in the body,

From what has been said in the former part of this paper, and the convincing experiments there narrated, it seems to us that it is clearly demonstrated that these specific germs may be conveyed to the lungs and respiratory passages, during the act of respiration, through the expectorated matter floating in the air, thrown off from the decaying lungs of phthisical patients, and finding a lodgment, a nidus, in the mucous membranes, a local trouble is set up which soon invades the lymph glands in the immediate vicinity, and unless arrested at this point, the disease speedily becomes general through the contamination of the blood. The experiments and observations of Dr. Grad, veterinary surgeon, at Wasselonne, Alsace, on the spread of the disease by contaminated stalls are very conclusive, and demonstrate the proposition that CONTAGION by CONTACT is possible, and that the extension of the disease by cohabitation is of more general occurrence than is usually supposed.

This fact being established, the question naturally arises, what can and should be done by those dwelling under the same roof, and who are daily brought into contact with friends sick of the disease, and especially those who nurse the patient?

In the first place, they should be very particular to have the air in the rooms pure, by thorough ventilation, in order to get rid of the emanations from the lungs, the impurities constantly floating in the air of the sick-room.

Second, they should be exceedingly careful to avoid inhaling the breath of the sick one. Therefore, they should avoid sleeping in the same bed or in the same room unless thoroughly ventilated. They should frequently go into the open air, and for several minutes at a time, fill their lungs to their utmost capacity with free, pure air, slowly exhaling the same. They should also by every hygienic measure at their command, keep their system in a good healthy condition, for it is undoubtedly true that a person in robust health can withstand the debilitating influences of tubercles inhaled into the lungs or taken into the stomach; while a debilitated and partially broken down constitution is a fruitful soil in which these living germs propagate themselves and grow. Then, again, every sick-room of this kind should be constantly supplied with efficient and appropriate disinfectants in order to destroy what remaining germs may be left by inefficient ventilation.

Then in case of death of the patient, the house should be thoroughly disinfected by fumigation with burning sulphur, the premises renovated, and every precaution taken to destroy the infectious virus.

DISEASED MEATS.

Another source of infection is undoubtedly through eating diseased meat, or meat infected with tubercle.

Professor Chauveau, of the Lyons Veterinary School, who has for years been experimentally studying the intimate pathology of the various contagia, presents conclusive proof of the transmission of bovine tuberculosis. The success of his researches has afforded some startling results pertaining to the use of diseased meat, and his well-designed experiments on cattle have settled among comparative pathologists the question of the virulence of tuberculosis. The discovery that certain rich virulent matter can infect as readily through the digestive organs as by any other channel, has given him a world-wide reputation.

Two years ago Professor Colin, of the Albert Veterinary College, contributed a series of observation on the *communicability* of tuberculosis, which were very conclusive and shed a flood of light on this important sanitary question in relation to diseased meat. Many other German and Italian authorities have put on record their clinical experiments confirming the truth of the above mentioned experiments. The celebrated Professor Orth, of Göttingen has lately published his researches and experiments, from which we extract the following: "He fed fifteen animals with tuberculous matter from a diseased cow, nine of which became infected; of these four died. The remaining five became extremely emaciated and were killed. On examination nearly all of the organs of the body were found involved in tuberculosis. Consequently the transmissibility of this disease to animals is proved." He insists that its transmission to man is possible, and has undoubtedly many times taken place.

Dr. Cressy, in Report of Connecticut State Board of Health, for 1880, says, "Nowhere in the struggle of life against the manifold causes of disease do we more effectually imperil our health and happiness than in partaking of animal food of a suspicious character." He also says, "The meat from cattle affected with tuberculosis is not unfrequently found in our American markets, especially in our larger cities, and even in country towns;" and adds, "I now affirm in a pathological point of view, that the baneful consequences to our health from the use of infected meat and milk are not surpassed in the whole catalogue of contagious affections."

Such infected meat, therefore, should not be used; for any organ or texture in which tubercle has been deposited is surely a dangerous article of food. From what is known in relation to the pathology of this virulent malady, we should interdict the sale of consumptive meat and milk, especially in the advanced stages of the disease when the glandular tissues have become involved.

COOKED MEAT.

The question naturally arises, does cooking the meat destroy the infectious qualities? On this point we have the experiments of Professor Gerlach. Solid, fibrous, and broken down tuberculous masses were cooked from one-fourth to one-half hour, and then fed to five small pigs and ten rabbits in considerable quantities. The result was that the five pigs and five of the rabbits, two-thirds of the whole number, contracted the disease. In all the experiments with cooked food, the animals were less affected than those fed with raw meat.

From this it appears that tuberculous meat cooked from one-fourth to one-half hour is still infectious, yet in a less degree than in the raw state. It is probable, however, that long, thorough cooking would destroy the virus.

TUBERCULOUS MILK.

The recent investigations of Professor Bollinger, of the University of Munich, on the artificial production of tuberculosis as induced by the consumption of diseased milk, are of the greatest importance. He claims that the milk of such animals has a preëminently contagious influence, and reproduces the disease in other animals experimented on from that point of view. He believes also that such milk, even when boiled, still retains its injurious properties.

Furthermore, he maintains that beyond doubt the tuberculosis of the human subject, though not completely identical with that of the cow, is yet strictly analagous to it, and that consequently the wide prevalence of tuberculosis in the native herds, at least five per cent of which are affected, is a standing danger to the community.

In speaking of this subject, Dr. Fleming, of the British army, who has given the subject much attention, says: "There is every reason to *prohibit* the use of milk from cows affected with tuberculosis, and especially for infants, who mainly rely upon this fluid for their sustenance, and whose powers of absorption are very active. Even if it did not possess infective properties, its deficiency in nitrogenous elements, fat and sugar, and the increased proportion of earthy salts, would alone render it an objectionable article of diet. In fact, it has long been known that it was liable to produce diarrhea and debility in infants; but though many children fed on such milk have died from tuberculosis, or a localized type of it in the bowels, known as *Tabes Mesenterica*, the part probably played by this liquid in its production has rarely been suspected." He further observes, that "as the commencement of phthisis is generally so insidious in the human species, it is most difficult to arrive with any degree of certainty at the causes which directly induce or favor its development; but, from the evidence before us, it is to be feared that at least one of its sources must be referred to the utilization of the *carcass*, but more especially of the *milk*, of phthisical cattle as food. It is certain that tuberculosis is not uncommon, and that it is a destructive disease among *dairy* cattle especially, and more particularly those in towns; that the udder of these animals is one of the glands not *unfrequently* involved; that infants and adults consume milk in somewhat large quantities,—and that phthisis is a very prevalent and fatal malady in the human species, and chiefly among the dwellers in towns and cities."

Dr. Bromley, of Lancaster, England, found characteristic tubercular lesion in the pulmonary organs of two pigs, which had been fed on milk from a consumptive cow; while the mother of the pigs showed no signs of the disease on being slaughtered. Hence, the necessity of guarding ourselves against such a diseased article of food.

Professor Gerlach, Dr. Toussaint, and many other veterinary pathologists have demonstrated by hundreds of positive experiments, that this milk is *infectious* and contains a *specific virus* that can be transmitted from one species of animals to another and from animal to man, thus proving the *identity* of this dreaded bovine malady with that in the human subject.

SANITARY REGULATIONS.

It being satisfactorily proved that the disease may be and often is communicated in this way, it naturally follows that there ought to be some necessary *sanitary regulations* and sanitary officers to enforce these regulations, in order that we may be assured that our meat and milk supplies are pure and wholesome. There is no doubt but the traffic in this country in diseased meats is quite extensive and calls for appropriate legislation to prohibit it. The public health is involved, and everybody should understand the danger of contracting the disease in this way, and the importance of having competent inspectors to protect our lives from the invasion of disease from this source.

Great Britain has inaugurated this movement, and now has professional inspectors at all the principal commercial points in her vast domain, and recently several important stations for pathological observations have been created by the British government. This government ought to follow close in the footsteps of her illustrious mother and inaugurate and maintain similar stations and officers in this country; then we might expect that very much would be done to assist in preventing the ravages of this great scourge of the race.

The next paper was on Medicinal Nostrums in their Relations to Public Health, by Prof. A. B. Prescott, M. D., of Ann Arbor. It is as follows:

NOSTRUMS IN THEIR RELATIONS TO THE PUBLIC HEALTH.

BY ALBERT B. PRESCOTT, M. D., F. C. S., PROFESSOR OF APPLIED CHEMISTRY IN THE UNIVERSITY OF MICHIGAN, ANN ARBOR.

This is a class of articles, risen into importance in this generation, and already of very extensive consumption, articles which are not food, but are taken into the body, and therefore concern the welfare of the body and the vigor of the commonwealth. These articles are everywhere presented to individuals for the restoration of health, but they are not defined or described in any of the books or schools of medicine, they receive no supervision from any organized body of learning, no direction from any responsible authority. Nothing can be found out about them from any established sources of information; none of the associations of commerce or industry or science take charge of them, and, as they closely relate to the health of the public, it is certainly right that Boards of Health should have some care for them.

In common and indefinite parlance they are known as "patent medicines," but only a few of them are in fact patented. If they were held under rights patent, the records of the patent office at Washington would reveal their composition, to such as would take the trouble for the search. Their titles or trade-marks are usually secured under copyright; but the titles seldom give any serviceable information of their constituents. They are spoken of as "proprietary articles," each one being presented on the authority of some person as its owner. The fact of individual ownership is to their credit just so far as their proprietors are held responsible to their consumers, but for the most part they are issued by men unknown to the public and nowhere having reputation for competence in the treatment of the human system for disease. Honorable men are engaged in their sale, and good men may be employed in their manufacture, but these persons are not legally responsible for the good faith of the manufacturers. Certain of their proprietors have an abundant financial responsibility, and yet, whatever may be the reason for it, not one of them appears to be actually held as accountable in money or in person for any degree of correctness in his published statements as to the contents of the articles which he sells to be taken into the human body. Physicians are now and then brought into court on charges of malpractice, but the proprietors of special medicines are quite beyond the probability of prosecution. The one feature of this class of articles which more than any other compels our attention is that of their concealed composition. They are put up in packages *not marked with the names of the substances they contain but with the names of the diseases they are to be used for.* They may be termed nostrums. A nostrum is defined by Webster as "*a medicine, the ingredients of which are kept secret* for the purpose of restricting the profits of sale to the inventor or proprietor." It does not matter what purpose the proprietor has in trying to keep a secret of the ingredients; it only matters to the public that the article is presented without a fair and simple statement of the things that are in it.

Now to what extent are the so-called "patent medicines" consumed in the United States, in the State of Michigan, in the civilized world? In the absence of statistics, an estimate sufficient for present considerations may be asked of any person who walks abroad in these days. A few years ago, an inquirer drew the conclusion* that about eighty million dollars worth are annually sold in the United States, this being at the rate of two dollars for each man, woman, and child in our country. This may be below the true estimate. But it is an outlay exceeding that for some things in which we are held to be liberal. For the salaries of all the teachers in all the public schools of this proud State of Michigan, the yearly payment amounts to but one dollar and thirty-two cents for each inhabitant. The total expenses in the public schools of the United States do not require payment of over two dollars from each inhabitant. We may claim, then, an equal liberality toward public schools and patent medicines, with partiality toward neither. In England, in 1879, the stamp tax on nostrums was two-thirds of a million of dollars. In Germany, although the law has undertaken to restrict or prohibit them, they are sold in immense quantities, American nostrums competing sharply with those of the *Vaterland.* In spite of regulations by the French government, Paris is a center of trade in the nostrums of the world. Russia is plagued with them, and licenses a part and prohibits the rest. The Swiss Federation has been trying to prohibit the sale or advertisement of medicines of secret composition. Belgium is setting about to prohibit their importation; she will not tolerate humbugs of foreign origin. The United States taxes them. A single proprietor, perhaps not the most extensive, has paid our government $120,000 per annum for stamps to put upon the nostrums of his own production. At retail, then, the people paid three million dollars a year for this man's wares, and his own annual income was not far from one million dollars. This amount equals the average net income of a railroad three hundred and eighty-four miles long, in the United States, in the year for which this comparison was made. There are extensive wholesale dealers in "patent medicines" alone, and the catalogue of a single house has included fifteen hundred kinds of nostrums. No small share of the trade of the fifteen thousand drug stores, and of a considerable number of grocery stores, in the United States, consists in the sales of nostrums, and yet a single "patent-medicine king" may make as much net profit in a fortunate year as all the retail drug stores in a city like Detroit, with their patient service of filling prescriptions by day and night, and with their paltry commissions on the nostrums included. How much is paid for advertising nostrums; who can tell? Some one has said over ten million of dollars a year. Enough to give over twenty universities of the first class, with free instruction, a better support than Harvard possesses. You have a piece of property to sell, or a legitimate and thriving business to cultivate, and you advertise it liberally in one or two of your local papers, but a man who is putting a pill on the market will fill up a larger space than yours, and his advertisement will be spread out in the newspapers in every city in the country,—his paltry tokens will be displayed along the dead walls of a hundred thoroughfares,—the types may be already setting up translations of his braggadocio in the newspapers of other nations.

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* Dr. R. W. Murphy—Pacific Medical and Surgical Journal, May, 1874.

But what is the actual, average nature of the nostrums of the civilized world, to take them as they really are—in nothing to extenuate, nor set down aught in malice—what is their power upon the body, and their influence upon the health of the people at large? We limit our inquiry to such as are distinctively nostrums—that is, bearing no practically true statement of their constituents, and we must of course depend upon the results of chemical analysis for our information of the substances that are in them.

We will begin with "Pain Killers," one of the most harmless kinds, because chiefly of external application. Few of them are wholly inert, and most of them have a transient stimulant effect. Of *eight* of them, subjected to analysis, six were found to contain the ordinary spirit of camphor, which every thoughtful mother keeps in the house, three contained ammonia, such as any hartshorn bottle would furnish, four were charged with red pepper, all had some alcohol,—oil of sassafras was found in four of them, oil of turpentine in two of them, tincture of guaiac in two, chloroform in one, and myrrh in one. One of the most successful contained, in a half-dollar bottle, one-and-a-half fluid ounces of soap liniment, with one-half fluid ounce, each, of capsicum tincture, ammonia water, and alcohol,—in all, four articles of the United States Pharmacopœia. One that was sold at a dollar for a four-ounce bottle, by a Chinese doctor, who had studied many years in the Celestial Kingdom, and who visited the towns of Michigan in a gorgeous car drawn by four horses, with a company of musicians and a lecturer, consisted of camphor spirit, lavender compound spirit, ammonia water, sassafras oil, and alcohol. One made and sold in Germany, as Nature's Own Cure, a sure relief for one hundred and sixty-six different diseases, consists of red pepper tincture, ammonia, and alcohol. Another, noticed since grouping the eight articles, is a Five-minute Fragrant Pain Curer that will quiet every ache within five minutes by an exact time-piece. It is a mixture of ether, glycerine, common salt, and water. A Golden Wonder, or Seven Seals, for all the ills liable to occur in this life, is a mixture of ether, chloroform, camphor, peppermint oil, red pepper, and alcohol. Nearly all of these articles are directed to be taken internally, as well as applied externally. Now almost every person would have some judgment as to how much of ammonia, or turpentine, or camphor, or ether, or strong alcohol, it would be safe to take at once, if to be taken at all in seeking relief from a violent pain, but what judgment can anybody have as to a safe quantity of such talismanic articles as "ready relief," "wizard oil," or "magic master of misery"?

A class of nostrums finding considerable sale in Michigan, is the line of ague-cures. Of *six* of these collected and analyzed in this State, five were found to contain the cheaper alkaloids of Peruvian bark,—that is, the medicinal principles accompanying quinine and of similar effect but held in less esteem, so that they are separated from quinine and sold at a much lower price. Red pepper was found in two, aromatic sulphuric acid in two, molasses or syrup in five, and wintergreen oil in one. One consisted of a thin mixture of powdered charcoal, the tincture of chloride of iron, and syrup. These articles were all extended especially to those who had found injury instead of relief from the taking of quinine and other preparations of the bark, and each was published as a new discovery.

The hopeless diseases—those dread afflictions that find no cure in the resources of science and no positive encouragement from the honest physician—furnish a tempting field to the nostrum-vender. The promissory cures for epilepsy are very numerous. Of those analyzed by myself for some years, the greater number have consisted of various disguised forms of bromide of potassium,—the common remedy for palliation of epilepsy, and one familiar to almost every epileptic and his friends. The last instance that came to hand had a little red bitter bark, common cinchona, in fine powder, mixed with the water solution of the bromide. The sufferer found so much relief from it that he got it analyzed so as to obtain it without paying such an excessive price as was charged for it, but the result of the analysis is likely to lessen his confidence in it. In a German report of the analysis of *nineteen* articles sold to the people for epilepsy, only four were found to contain the bromide of potassium, six contained various miscellaneous ingredients, mostly vegetable and of little or no effect of any kind, and nine were wholly trivial and inert. One of the latter was a red-colored spirit of camphor, another was a powder of roasted acorns, another an amulet of certain seeds quilted in cotton to wear about the neck. It is noticeable that four of these articles—steadily sold for years under the same name and with the same declarations, had yet undergone an entire change of composition. In one case a powder which had maintained a steady reputation for relief of epilepsy during 70 years, had been changed in its composition three times, the only constant constituent being the volatile oil of cajeput, by which it was scented. At one time it contained magnesia, during two changes it retained muriate of ammonia, and for a long while contained valerian root.

It is hardly probable that a single purchaser for any of these articles—all held at prices a hundred times above their cost—would have taken them if knowing their composition. But in the uncertainty of the unknown, in the vague and imaginary possibilities of the hidden, perhaps in a misdirection of the instinctive appeal of the distressed to the supernatural for relief and restoration, the fancy of the poor and well-nigh desperate victim of an obstinate malady clings to the irrational assumptions and specious promises of the craftily worded advertisement as to the very spectre of a chance for recovery. Just as men driven to straits will put their last pittance into the lottery instead of the savings bank, or as men find in their natures a temptation to venture their prospects at the gaming table, or as harrassed persons in critical times turn to the fortune teller, so, with the better excuse of bodily prostration and nervous restlessness, against his own judgment, and suffering with a glimmering apprehension of the wholly unscrupulous character of the human harpies who practice on his credulity, the sick man tries one game of chance among *the unknown remedies,* and tries again, one more, and tries one after another, But mark you, here is a difference: the lottery wheel, the gaming table, and the fortune teller are fully outlawed by the common intelligence of the times, and their victims are few, but on the other hand the miracle-promising panaceas are not fully discarded by the current thought of the people, and their victims are very many.

Probably the most extreme illustration of what may be called the tragical side of the nostrum business is to be found in an uncovered view of the operations of the "cures for the opium-habit." The writer has analyzed enough of these and read enough of the feverish correspondence of their victims. In most all cases the articles consist wholly of morphine disguised in colored and flavored solution. In a few cases quinine or cinchonidine as a tonic, is substituted for a part and at times for all of the morphine. The strength of the solution, for the same patient, changes from time to time, and changes of the tonics have been found. The operator advertises with reserve, little more than the words Opium Habit, *cure*, and his address. To inquirers he invites a letter from the opium-taker himself. When he gets this he is ready. He sends a highly wrought pamphlet with vivid portraiture of the power and pains of the habit, made up from the most morbid literature of this subject, intensified by narrations of the wildest experience, and toned with the most assuring sympathy. It would be enough to give a susceptible person the opium habit just to read it. Those who are but slightly addicted to opium, or invalids just beginning to depend on it, take on the impression that they are hopelessly enslaved. But the promise of cure is certain and the certificates enough to prove charcoal to be white. The remedy is costly but it is ordered. It comes in fixed quantity to last exactly thirty days, with most positive instructions to take just the required doses of the mysterious liquid under penalty of great danger from any variation. The patient, for such he is called, begins. At first he is rejoiced that he can do without his morphine, then suspects that there is morphine in the unknown medicine and demands explanations, and makes complaints. Constant correspondence is insisted on, frankness required, and every doubt is met with decision. So the pathetic farce is protracted; on the one side, art and audacity and cold, merciless persistence, on the other side alarm and hesitation and despairing appeals, until the judgment of friends or the service of an analyst dispels the illusion, and leaves the victim to realize that he is sold to his own habit by the one whom he engaged to defend himself against it. Whether the autocrat of the opium antidote ever uses his control to diminish the supply of the narcotic, and weaken the habit, cannot be positively declared, but such cases have not been found. And for this nostrum-vender, certainly, the symbol of the spider and the fly would be too tame a trade-mark, and his own service with chain and ball not too severe a retribution.

With equal hypocrisy but with vastly less mischief, are some of the modern life-elixirs. An Elixir of Life Bitters, put up in New York, is reported from Berlin, to contain aloes, cinnamon, sweet flag, angelica-root, saffron, burned sugar, glycerine, and strong alcohol. A Swedish Essence of Life consists of aloes, rhubarb, saffron, myrrh, and roots of zedoary, gentian, and galangal, in alcoholic tincture with sugar. A German Aromatic Salt of Life, to correct acidity of the stomach, insure a good appetite, and supply all the saline elements proper to the human body, consists of baking soda, table salt, Glauber's salt, and sugar, flavored with a fragrant spirit of cinnamon, cardamom, bitter orange peel, and root of violets. This mixture is sold—for constant use with the food—at a quarter of a dollar a pound. Quite different was a Swiss Elixir of Life and Cure for Lung Diseases, found to be pure spring water, directed to be given in small doses. Also a Soothing Powder, presented, with careful directions for sparing use, to quiet the nerves, was found by Hager to be pure rice starch. The Wondrous Salt, for a number of particularly designated diseases, was a fair grade of saltpetre, and a notorious Renovating Resolvent, that has fastened its alliterating trade-name before our faces, the analyst finds to be a sugared extract of ginger and cardamom. A Nerve Balsam consists of alcohol with essential oils of lemon and bergamot; a Nerve Spirit, of alcohol with oils of lavender and rosemary. A "Golden Medical Discovery," and a "Favorite Prescription," companion catch-words of enforced familiarity in two hemispheres, have flourished just as well since both their analyses were published, five or six years ago,—the former consisting of laudanum, lettuce-extract, honey, and very raw whisky; the latter, of savine, agaric, opium, cinchona, cinnamon, anise oil, gum arabic, and alcohol.

The cosmetics on the market are mostly given without a proper statement of their ingredients, and, while many of them are harmless, many others contain substances that are injurious to the skin and to the system, substances so well known in the common information of the public that nobody would use them if their contents were declared. Among the liquid cosmetics—the lotions for ladies' use upon the skin—coming from time to time to analysis under the writer's observation, every little while there comes an exceptional one charged with corrosive sublimate. Some of these are clear solutions, some of them have a white powder of chalk or terra alba settling to the bottom, one of them had a white sediment of calomel (the insoluble chloride of mercury); most of them are delicately perfumed, a few are without odor, certain of them date from Paris and have labels in French,—but they are alike in having the worst constituent of all cosmetics, for the corrosive chloride of mercury is rapidly absorbed through the skin. Some years ago, a collection of *twelve* cosmetics —lotions and powders—from the drug stores of Ann Arbor were found to be all innocent of mercurial or lead compounds. Three of them contained bismuth, as sub-carbonate or as "pearl white" (oxychloride); three contained zinc white; eight had chalk; seven had terra alba and five had magnesia. Not less injurious than the corrosive sublimate, if long used, is the "white lead" put in some of the face-powders. A week or two since, a middle-aged woman, of intelligent address, applied for treatment at the University, and was found to be suffering under a paralysis unmistakably resulting from lead-poisoning. As she had not been engaged in contact with the manufacture or use of lead paints, there was some perplexity as to the case, when inquiry was made about the use of cosmetics. Yes, she had used a certain "flake-white" for a long time, for thirteen years, getting it at different places wherever she had called for it. Then a portion was obtained from her, and on analysis was found to be wholly carbonate of lead, a levigated article of white lead. A celebrated French actor died in 1875, from lead poisoning due to use of lead colors in oil, in making up his face for the stage.

It is to be supposed that everybody is well enough warned about Hair Dyes, apt to consist of sugar of lead, or nitrate of silver; and the Hair Restorers are of the same sort. Two years ago, a New York chemist, Mr. Benjamin, reported on *twenty-one* Hair Dyes and Restorers. Six of these were harmless, and fifteen were poisonous, all containing lead. In conversation with an eastern dealer in chemicals, a few days ago, he remarked that there was beginning to be a considerable demand for peroxide of hydrogen. It would be a very useful disinfectant, but it is too expensive for that purpose. It is mostly used for the hair—in favoring the preference for blonde colors—and its expensiveness does not lessen its demand for this use.

In certain lines of nostrums, for diseases readily amenable to remedies or palliatives there are found a considerable number of standard and efficient medicines. Of cures for asthma and catarrh, an analysis of *six* found belladonna and nitre in two, both to be used as fumigating pastiles, another pastile consisted of nitre and sawdust with aromatics, one used as a snuff contained tobacco and asarabacca, another, a standard one, contained camphor, carbolic acid, golden seal and common salt colored with Prussian blue, while one for inhalation contained carbolic acid, camphor, and wintergreen oil. This last was entitled "carbolate of iodine," and was the only one of the six that made specific mention of any constituent, but the preparation did not contain iodine at all. The name contained the iodine, and in all nostrums the name is the principal thing.

Two years ago a collection of *eight* specific nostrums for rheumatism, on sale in Detroit and Ann Arbor, were subjected to analysis at the University. Salicine, now much used by physicians in the treatment of rheumatism, was found in three of them, iodides in two of them, and alkaline acetate, colchicum and nitre, each, in one. One, in pill form, contained only red pepper, liquorice and sugar, and one in a cochineal-colored solution, held only alum and common salt. Of the eight only one made declaration of any ingredient, and this one did contain the substance by which it was entitled. One of them claimed to be charged with electricity combined with essential oils; oil of origanum and oil of tar were found, but the electricity must have evaporated (!) before reaching the analysis.

Three years ago Professor Richter published a summary of 938 secret remedies analyzed by himself and other chemists. Of these he found 22 per cent having some violent or poisonous constituents, 25 per cent having medicinally powerful constituents, 52 per cent having only harmless or inert constituents.

It is the claim of the publishers of secret remedies, that they consist of newly discovered articles not in general use by physicians, but only to be obtained in the nostrums offered. The public are impressed with the assertion from each nostrum in its turn, that it contains articles not embraced in pharmacopœias, nor in current use among domestic remedies. These claims of originality are flatly contradicted by the results of analyses, and the analyses have been very extensive. The constituents found, so far as they are such as to have any action on the system at all, are those of common use, well known not only to physicians, but to most persons of ordinary information. As to the quantities of the medicinal ingredients in the dose directed, these are very irregular, and in few cases are they in true and efficient proportion.

It is particularly to be observed that the composition of a nostrum may be radically changed while it is steadily before the public under the same name and description. Several instances have been given in the brief categories which this occasion permits, and numerous others have been already revealed by analysts. A noted soothing syrup for children at one time was reported by at least three several analysts to contain morphine. Of late years the same advertised nostrum as mostly sold contains no morphine, but only some oil of fennel. It is very clear that to a patent-medicine proprietor the name and notoriety are everything, the ingredients and their proportions are very little, either in cost or consequence. He invests thousands in notoriety of a trademark; he secures it by copyright; it is his main investment; he may sell it or hold it; he may try to strengthen his investment by altering his nostrum so as to give it some popularity on its own merits, and in this alteration he may experiment or he may be ready to realize on his investment the utmost profit by further cheapening its cost, and see how long it will run without any present merit of its own. The nostrum-maker fills his bottles behind closed doors, but he has published his name over the continent at great expense, and it is the *name* that people are to buy and take three times a day and depend upon when dread disease is staring them in the face.

It may be submitted now that *the use of patent medicines without a knowledge of their composition does injury to the health of the people.*

(1) Because they may, and in fact sometimes do, contain powerful or poisonous articles unsuspected.

(2) Because they always may be, and often are, inert, and become a false reliance to the neglect of other and due measures in the care of health.

(3) Because they are liable to be changed in composition, so that any experience of their effects as they are purchased at one time is not conclusive as to the same named articles purchased another time.

(4) Because it is submitting health to the treatment of a distant and irresponsible stranger, and learning to hazard health in an apparent game of chance.

(5) Because they are trusted to act as antidotes to disease in the sense in which no medicines can antidote disease.

(6) Because they favor excessive recourse to medication and thereby increase the resort to physicians and intensify the demand for the physicians to give medicines whether needed or not.

(7) Because their analysis shows the greater part of them to be given with multiplied falsehood, and the patronage of falsehood must be demoralizing both to the mind and to the body.

Before considering how to stem the tide of this evil, let it be fairly seen that there is a legitimate demand for domestic remedies, to be used without the advice of physicians. Some medicines people ought to have in their houses. Still others people will obtain for disorders as they arise, and take them on their own responsibility. Undoubtedly they do this to an extent greater than is good for them,—but that is no part of our present subject. There is little question but that people are disposed to take too much medicine, and physicians are inclined to give too much medicine. Physicians are learning to treat diseases with less and less medicine, and learn the lesson a good deal faster than the people learn it. The people must have time to be taught the limitations of specifics, and therefore let the people be well provided with standard remedies, just so far as they wish to use them. The United States Pharmacopæia has from time to time added preparations to supply the call for household medicines. There are many such, for various uses, in every drug store. Let physicians of all sorts contribute them. But let it be indispensable that every article is labeled with its distinctive name. If it is a preparation not having an acknowledged name, let its formula of constituents be put on the package. The names should be in the best authorized terms, with popular synonyms when these will be sooner understood. The simple scientific name, in English form, is the best term to use. If the elderly people understand a certain substance best under the name of "nitre" or "saltpeter," the rising generation will know it better as "nitrate of potassium." For plants, the Latin names, in language of botany, are of first importance, but popular synonyms can be added. However, one who cannot understand any botanical, or scientific, or Latin name, has but to consult a distionary or ask interpretation of the nearest school teacher or of the druggist. Any term becomes popular if used. Only let every article that anybody is to buy and use as a medicine have its constituents and their proportional quantities given, fairly and squarely. Let it come to be known that people will not buy things to take, unless their contents are defined.

We would like to go a step further. We would at least discourage, if not now utterly discountenance, the putting of the names of any diseases on any packages of medicine. Is it an objection that many people would not know by the medicinal name what disease the article was good to cure? Then by whom are they to be informed? Who is to assure the purchaser that the contents of the package will be useful for the infirmity? Shall it be any man who gets advertisements put on the fences? Indeed general statements of whatever authority still leave the question to be decided by the patient and his friends. If he is to get advice, he ought to get the best. And it would be hard to obtain any credible medical authority to write down what diseases an article of medicine would be invariably good for. Still if any honest person can be induced to specify some names of diseases to be indicated in a secondary way on certain packages of medicine, let so much be granted in compromise—but it must be insisted upon that the medicinal name be placed the first.

And now if it be in the main quite true that the use of nostrums is a source of positive injury to the public health, and a vitiating and wasteful absurdity, how are the people to be helped to get rid of the burden? Accepting the diagnosis, what should be the treatment?

Well, in the *first* place, begin the work of common sense in the public schools. Teach physiology, the structure of the vital organism, and the cause and effect of health and disease. Teach the rudiments of chemistry and botany if you will, but let the next generation know that it is the body and not the disease that is to be treated, and that universal panaceas are relics of superstition. Cultivate a stalwart physical independence, and a scrupulous prudence in the treatment of bodily infirmities. Security from charlatanism is dependent upon the intelligence of the people. In view of the indiscretion of this generation, it seems to be high time to look to the training of the next. This is the surest measure, aye, and the quickest, that can be adopted.

In the *second* place, let the actual composition of nostrums, as found by analysis, be more fully published among the people. Enough of the marvelous mixtures have been and are being analyzed to more than establish the prevailing imposture and absurdity of the entire class. The results ought to be spread before the people. A few years ago a prominent pharmacist of New York began the publication of a health almanac, chiefly devoted to the revelation of the contents of current nostrums, and the undertaking ought to have been supported. In the German language there are, among other sources of information, two compact dictionaries* of analysis of modern nostrums, including the chief ones made in this country—those sold abroad. Analysts report upon nostrums, at the cost of no little labor and time, and more reports should be made. Ask your druggist to make analyses of such as are finding the most patronage. A good many pharmacists at present are competent to make chemical analyses, inorganic and organic, with microscopic examinations, and all the pharmacists of the future should possess this qualification. No profession of men receives greater detriment from the nostrum trade than the dispensing druggists. The most of them consent to sell these things as they do all medicinal appliances called for by anybody. If they did not keep them for sale, their customers would think their assortment very incomplete. In the larger cities, a few pharmacists keep no nostrums, and these are encouraged, or ought to be, by a better support from the people and the physicians. But the "patent-medicine" proprietors, to whom the profits chiefly go, will find their own ways to put their wares in reach of the people. All the journals and other established organs of pharmacy and of medicine, totally repudiate secret remedies, but so long as the people are in the condition to be duped, nostrum-venders will fatten on the opportunity.

In the *third* place, it would be altogether an equitable measure to enact a law requiring all articles of medicine to be marked with their distinctive and established names, and all preparations for medicinal use to bear a statement of all their constituents in terms of the quantity of each. Let secret remedies be contraband of trade. Leaving every man to buy what he will, and use what he will, on his own responsibility, whether he knows anything about it or not, let the law interpose to prevent fraud. It is contrary to the spirit of the common law to admit the sale of a chance, or of an article represented to be something other than it is, or of uncertain weights and measures. To make regulations to stop an extensive class of deceptions is certainly within the scope of legal enactments. Such a law ought to commend itself to the world of trade, as a measure to promote fair dealing. The nostrum maker could not plead that he suffers a loss of value from publication of his secret, for the law grants no monopoly in compositions of matter, unless they are under patent, and a patent gives no assurance of secrecy.

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* Wittstein's Geheimmittel-Lehre, Nordlingen, 1876. Hahn's Geheimmittel, Berlin, 1876.

Such a law would be just, but would be useful no further than sustained by the information and judgment of the people. The fully awakened intelligence of the public, in this country, furnishes a support for sanitary regulations better than that of the more arbitrary powers of European governments. With a sufficient popular basis of well-apprized common sense, a good sanitary law, more comprehensive than individual action, brings conclusive results. And, indeed, with law or without it, the baneful body of the nostrum business, already swollen near to the period of collapse, may be safely trusted to fail altogether in the robust atmosphere of an enlightened people.

The paper by Prof. Prescott was followed by one by Amos Crosby, M. D., of Albion, on a similar subject, namely, Some of the Evils which Result from Free and Injudicious Administration of Nostrums to Infants and Young Children. The paper is as follows:—

SOME OF THE EVILS WHICH RESULT FROM THE FREE AND INJUDICIOUS ADMINISTRATION OF NOSTRUMS TO INFANTS AND YOUNG CHILDREN.

BY AMOS CROSBY, M. D., OF ALBION.

The maxim, "The whole need not a physician, but they that are sick," is as true to-day as when uttered by the Great Teacher more than 1800 years ago; and it could be construed to mean that when in health we do not require medicine. In fact, we can carry the idea still further than this and assert that when we are well all medicine is not only needless, but if taken may be harmful. That was rather a keen satire of the Italian tombstone,—

"I was well,
Wished to be better,
Took physic,
And here I lie,"—

though perhaps it may serve very well to illustrate the idea, as it is certainly true that there are medicinal agents which are very useful, indeed, almost or quite indispensable, in the treatment of some forms of disease, but which may themselves produce grave disorders if given in health and their use persisted in for a long time. Thus opium may cause the opium habit, or opium disease; and from the use of alcohol we may get inebriety or alcoholism. Both of these are diseases depending upon disturbed conditions of the nervous system. What I wish to call especial attention to at this time, however, is the habit that many mothers have of habitually dosing their infant children with such nostrums as soothing syrups and cordials. All these nostrums owe their peculiarly soothing properties to the opium which, in some of its forms, they contain. This fact, I think, will be conceded by all, especially by all medical men. These nostrums are given to quiet the little ones and cause them to sleep. The babe is peevish and fretful, and hinders them in their occupations. Hence it is dosed with the soothing nostrum. This practice is sometimes carried to an alarming extent. The child becomes so used to the drug that very large doses are required to produce the desired effect. To a babe of six months as large doses as a prudent physician would usually feel safe in administering to an adult are given. Children become under this practice extremely tolerant to the effects of opium, and are very irritable and peevish when not under its influence. In fact, with these children the opium habit is already established, and doubtless would be continued if the child had the power to gratify its desires. But after a time, as the child grows older, the cordials are gradually withdrawn, and finally cease to be given at all, or only occasionally, and the child is said to be weaned of its habit. People are apt to think that the habit is now broken up, and that this is the end of the matter. But is the child free? And has it sustained no injury from being almost constantly under the influence of opium for so long a time? We must remember that opium has a powerful influence upon the nervous system, and that it greatly weakens its power when its use is long continued. It not only impairs the nervous tone, but it weakens the will-power. The habitual opium eater is vascillating and unsteady. He has but little self-control. The influence of opium upon the young child, in the cases we are now considering, is at a period of its life when its nervous system is in its most plastic condition. It is then just commencing to develop its powers. Hence any strong impression then made must, in a greater or less degree, influence its course through life. Moreover, as we have seen, the child has acquired the power of enduring very large doses of opium; has in fact acquired the opium habit. What does this mean? It means that under the circumstances opium has become necessary to the child's comfort. It means that such a child is not in a condition of health. When a child is free from all disease, it does not need opium to make it feel well. The uneasy feeling which the child suffers when not under the influence of opium, grows out of the diseased condition of its nervous system, which has been produced by the long-continued use of the drug. It seems to me that many children have their mental faculties and perhaps their physical powers permanently impaired in this way, so as never to have that strength of body or of mind that they might otherwise have possessed. This view I think a reasonable one, but in the very nature of things it cannot be demonstrated.

I have said nothing of what the child must suffer when obliged to do entirely without its accustomed opium, while its nervous system is being adapted to its changed condition. Only one who has himself been addicted to the habitual use of opium can have anything like an adequate conception of the misery that such a child is compelled so endure. This, however, is not all. Nor is it the worst injury inflicted upon the child. Those children who have been habitually and freely dosed with opium for a period ranging from one to four or five years, during the earliest part of their lives, are in far greater danger of falling into the same habit and of being confirmed in this habit than they otherwise would have been. One can never entirely throw off the influence of habit when once acquired. Habits grow into our very natures until they become a part of ourselves. If we break off from a bad habit, how natural and easy it is for us to fall into it again. Habit exerts so powerful an influence over us that our tendencies and inclinations undergo a change, and we become different beings, with changed desires and changed aspirations. Every impression made upon the nervous system of the child, however young the child may be, helps, as we have seen, to determine its course through life; helps to form the tastes, the habits, and the character of the coming man or woman. How, then, can it be otherwise than that the child who has once learned to enjoy the soothing and quieting effects of opium, and whose nervous system, in a degree, has been moulded and shaped by its long-continued use, should be in special danger of falling a victim to its snares whenever proper exciting influences are brought to bear upon him? This view I think so very reasonable as to admit of no dispute.

There is, however, another question that is more intimately connected with the moral bearing of this subject. The question to which I refer is this: Does the practice to which allusion has been made have any influence in the spread of intemperance in the use of alcoholic liquors?

I will now define, more in order, but very briefly, what I understand by the opium habit as we meet it in the adult. I have made the statement that this habit is a disease affecting the nervous system; and I think this position can be successfully maintained. What I mean by the opium habit is this: When a person has continued the habitual use of opium for so long a time that he cannot leave it off without suffering great inconvenience, perhaps becoming seriously ill, he is said to have the opium habit. I regard such a person as in a condition of disease. His nervous system has been so changed by the habitual use of opium that he must now continue its use or life is almost intolerable. He often feels that he cannot live without his accustomed opium, that he must have it or die; and if it be at once entirely withheld, and no substitute given, grave consequences may follow. Unless too far gone, however, by proper care and treatment and long abstinence, he may in a degree recover, but probably never so completely as not to feel, at times, the necessity of his accustomed stimulant and narcotic, or to regain his former vigor, or be free from danger of a relapse.

Alcoholism or inebriety, as we have seen, is also a disease depending on a disordered condition of the nervous system. The exciting cause of this disease is the continued use of alcohol. A strong, hereditary tendency or predisposition may be transmitted from one generation to another. This inherited tendency consists of a certain nervous condition. This nervous condition, in many cases, is difficult to define, except that it gives rise to a craving desire for certain kinds of stimulants, and is said to be usually associated with a weakened will-power. Now it would seem that a very similar condition is furnished by the habitual use of opium, except, perhaps, the desire for stimulants in the majority of cases is much more intense in the latter condition than in the former. The continued use of opium creates a feeling of need of something stimulating to arouse and spur up the wasted energies of the nervous system.

"Inebriety," says Dr. T. D. Crothers, in the New York Medical Journal, Vol. XX, page 349, "is often foreshadowed in the indecision of character, weakened will power, and nervous irritability." Add to these conditions those already named as arising from the habitual use of opium, also the peculiar temptations that usually act as the exciting cause of intemperance in alcoholic drinks and we have all the conditions necessary. In support of the affirmative of this question it may also be stated that in certain important particulars alcohol and opium are very similar in their action. They expend their effects chiefly upon the nervous system. They first stimulate the functions of the brain, but this stage of excitement is followed by a feeling of quiet ease, which in turn is succeeded by drowsiness, and if taken in large quantities, by coma and complete insensibility.—(Bartholow.)

Moreover, it is well known that either habit may be easily changed for the other. When the inebriate gives up his cup he appeases his cravings for drink with the stimulating and soothing effects of opium; and on the other hand, deprive the opium-eater of his opium and he resorts to alcohol to arouse and stimulate his worn and tired nervous energies.

It may, however, be said that if the position taken is true in regard to the adult, the same results would not be likely to follow the continued administration of opium to infant children; that the child in its passage from infancy to adult life outgrows habits formed so early; that during this long period of growth and development its nervous system so changes that impressions made in infancy cease to exert an influence upon it in adult life. I have to some extent already discussed this question and endeavored to show that impressions made in infancy may give form to the character of the individual. We can never outlive our early impressions; they are indelibly fixed in our natures. Not only so, but impressions thus received by the parent are transmitted through him to the child. A tendency to drunkenness or inebriety may be transmitted in this way. The infant child, as we have seen, is fed opium until it becomes necessary to its comfort. This feeling of discomfort arises from the changed condition of the child's nervous system. As we have maintained, the child is now in a condition of disease. Withdraw the opium and after a time the child ceases to desire it, but the energy of its nervous system has been impaired. The injury done the child can never be atoned for. The disease which has been created is not permanently and effectually cured. It is only held in a condition of abeyance, ready to reappear with increased intensity on the presentation of proper exciting influences. If the child is a male and has a hereditary tendency to use alcoholic drinks then are his chances to become an inebriate greatly increased. And if there is no such hereditary tendency the opium, as we have seen, has impaired the tone of the nervous system, weakened the will power and created in the individual a feeling of need of stimulants. Such an one is vacillating and unsteady and has little control over his appetites and passions, and when he is placed in certain conditions of disappointment, of fatigue, or exhaustion, or under peculiar temptation, is much more liable to fall a victim to alcohol than he otherwise would have been. This may be thought by some a trifling matter. It certainly is not so. If the position I have taken is true it is a serious one, and if the views I have advanced and tried to support are in part incorrect, even then there must be enough truth mixed with error to merit our serious attention. The welfare of society, of the state and the nation depends upon the moral, the intellectual and the physical condition of the people, and if we desire our sons and daughters to become strong men and women,—strong physically, strong intellectually, and strong morally, we must see to it that not only their moral, their mental, and their physical training is properly cared for, but also that their physical systems receive suitable and healthful nourishment.

DISCUSSION ON PAPERS READ BY DRS. PRESCOTT AND CROSBY.

Rev. J. Morgan Smith, of Grand Rapids, said:—

MR. PRESIDENT:—We have all learned a great deal from these two papers, and their facts are undoubtedly well founded, and I do not see that there is room for discussion in the sense of qualification in view of what they have said. There is one point which I wish had been more fully explained in the first paper, and that is the benefit which is received from medicines. I understand, in some medical schools, both in the east and west, that it is not necessary to give any medicine at all, and only to use the power of imagination for cure. An old story is told that the Pope, once alarmed at the spread of superstition among the people and their excessive reliance upon miracles, issued a command that in a certain portion of France God should work no more miracles. This fascination of belief,—there is something wonderful in it. My question to the physicians is, Why don't you use that principle more? If there are eighty millions dollars' worth of nostrums in the United States, used by the people, on the principle that what is marvelous will be of benefit and produce marvelous results, why don't you appeal more to the imagination? I have seen some of the remarkable instances of the power of imagination. I was on board a train which stopped at a great railroad junction sometime since. Looking out of the window, over an open space beyond the depot, I saw a great crowd of people, and a woman standing upon the platform was giving out medicines and talking to them. A gentleman who sat next to me in the car said he knew who she was. He told me this story: She was a very ignorant person, but had acquired the faculty of pulling out teeth very rapidly, claiming to be able to pull sixty teeth in a minute. Her power over the people was so great that people with perfectly sound teeth would go to her to ask her to pull them out. She claimed to be a prophetess, sent from God, inspired, and succeeded in selling medicines to the people that had nothing in them to cure. You would hardly believe this exists in the 19th century, but it does. Some hocus-pocus physician comes to town to cure all the diseases to which people are subject. He advertises his business for two or three days and gets customers, and I have known intelligent men and women to leave their physicians, men of skill and wisdom, and patronize these traveling men. Either the physicians are all wrong in their modes of treatment, or else the people would not flock to purchase nostrums of these quacks, or else what we call the intelligence of the 19th century is the biggest lie that was ever put before the imagination of a considerate people.

Mr. ——— said:—

MR. PRESIDENT:—I suppose we all understand that the sick man is not very able to take charge of his own case. Physicians when they are sick do not undertake, if they are sensible men, to treat themselves. A man that is sick is dependent upon some one to take care of him. This being the case, if he takes some one well known in the community in which he resides, he is more likely to get a responsible and capable physician to treat him than he would be to resort to some patent-medicine man, who, from the very nature of the case, is less likely to be an efficient and responsible party to take care of him. This matter of the clinging of fancy to miracles being spoken of, we grant every bit of it. If it is true, the question might be asked, Why don't the physician rely upon it more? I submit that in the end the physician is the proper party to exercise his judgment. The patient is trusting in the physician. He knows very little about the diagnosis of his own case, but leaning on that strong man and trusting in him, his hope for recovery is just as strong, I think, as though he were taking some patent medicine. I was very well pleased with the papers, and really wish that they could be printed, and get these ideas and facts before the people.

CRIMINAL ABORTION.

Earlier in the convention a special committee was appointed to make a report on criminal abortion. The committee was as follows: Edward Cox, M. D., of Battle Creek; S. S. French, M. D., of Battle Creek; H. O. Hitchcock, M. D., of Kalamazoo. The report of the committee was made the special order for four o'clock Wednesday afternoon. This hour having arrived the President called for the report of the committee. It is as follows:—

REPORT OF THE SPECIAL COMMITTEE ON CRIMINAL ABORTION.

The special committee on criminal abortion has made some progress in the consideration of the subject, and respectfully report:—

That in selecting remedies for so great an evil it becomes necessary to ascertain the causes which produce it.

A morbid sentiment exists in the community that winks at, palliates, and defends the practice, claiming that it is proper, that a woman has the same right to destroy the product of conception, as she has to submit to a surgical operation for the removal of a tumor or any morbid growth from her body, and that the wretched abortionist is not only a necessary member of society, but is even as much of a benefactor as the honorable physician who conscientiously and legitimately pursues his vocation.

Entertaining these views, the pregnant woman often calls upon her medical adviser to produce an abortion as coolly as she would apply to a dentist for the extraction of a tooth, or at the market "would order a steak for dinner." The majority of people, erroneously believing there is no life previous to the fourth month of pregnancy, believe there is no crime committed in the practice before that period.

Legislators to a great extent entertain the same idea, and police officers and even courts and jurors have become so stupid as to look upon it as a mere peccadillo, and for fear of injuring the feelings of friends and innocent relatives of those who have practiced it, and even of those who have died from its effects, coroners and coroners' juries have prohibited necessary investigations even when informed by intelligent physicians that there was good reason to believe that an abortion had been perpetrated, causing death of the woman, thus permitting the murderer to escape and continue his homicides in almost perfect security.

To so great an extent is this now practiced by American Protestant women, that by calculation of one of the committee, based upon correspondence with nearly one hundred physicians, there comes to the knowledge of the profession seventeen abortions to every one hundred pregnancies; to these the committee believe may be added as many more that never come to the physician's knowledge, making thirty-four per cent or one-third of all cases ending in miscarriage; that in the United States the number is not less than one hundred thousand, and the number of women who die from its *immediate* effects not less than six thousand per annum.

All physicians agree that immense injury is done to the health of the survivors, rendering them invalids for life, and that children subsequently born of such mothers are likely to be feeble in body and mind, and incapable of successfully fighting the battles of life.

It is no wonder that the woman who loves fashionable life, who has never been instructed in the great danger to her life and health she is about to undergo, nor that the crime she commits is of any great importance or violation of God's law, should be tempted to practice it upon herself.

Propagandism has much to do with causing the same. Misery loves company. The woman who has escaped with her life will induce her friend to follow her example and become as desperate as herself.

Druggists, taking advantage of this sentiment, keep the subject before the people by gilt-edged advertisements, covertly or otherwise, and thereby poison the minds of their confiding customers.

The press by advertising for the venders of abortive drugs becomes a great evil factor in producing this morbid sentiment.

The Protestant clergy, by abstaining from giving correct moral and religious instructions in this matter, have a negative influence which favors the propagation of erroneous ideas.

Unprincipled men, calling themselves physicians, though unworthy of the name, for a consideration practice the diabolical crime, and to their everlasting disgrace and infamy lend their influence to the propagation of these ideas which annually cause the death of thousands of women, and the physical and moral degradation of tens of thousands of women and children.

Your committee believe the proper remedies for the depraved sentiment are agitation and education. Notwithstanding the obtuseness of the public in regard to this practice, and the great number of ante-natal murders committed, yet the committee have confidence in the American women, and believe when properly instructed in the great wrong they are perpetrating upon themselves, their families, and society, a reformation will take place, and that the Protestant woman, like her Catholic sister, will look upon the destruction of the first spark of life as a crime equal to murder, and will thereafter no more practice the sinful habit which opens the way to unbridled licentiousness, and will learn that to take away the responsibility of motherhood is to destroy the greatest bulwarks of female virtue.

The subject, therefore, should be agitated upon all occasions likely to educate the people, in all assemblies of this kind, in medical associations, theological bodies, and particularly by the press and pulpit. The last two are perhaps the greatest instruments to instruct the people in the needed reformation.

It is well known that in this country the faithful ministrations of the Catholic clergy prevent the commission of the crime to such an extent that it is very seldom committed by a Catholic married woman, and the committee believes that if the Protestant clergy would properly present the subject to their congregations with the assistance of the press and other auxiliaries, the crime would soon become as rare among the Protestant as the Catholic women. But the clergy claim to be ignorant on this subject. They must therefore be instructed and urged on to their duties by agitating it through the press and in assemblies like this and others of which we have spoken. The press needs educating almost as much as the clergy before it can place the subject in an intelligent manner before its readers.

It is believed that physicians are better acquainted with this matter than all others, and that they should keep accurate notes of all cases coming to their knowledge, to be properly used by boards of health, sanitarians, and others, for the purpose of educating the people, and that such boards of health, sanitarians, social scientists, educationists, theological bodies and physicians should be placed in correspondence with each other, properly educate the representatives of the press and the Protestant clergy relative to the extent to which it is carried and to the great injury upon the present and succeeding generations, and continue to agitate the question until they take hold of it and educate the readers of the one and the hearers of the other with the zeal, energy, and success they have attacked intemperance and other vices. The committee therefore respectfully recommend the passage of the following resolution:

Resolved, That the State Board of Health be requested by this convention to correspond with municipal boards of health, physicians, civil authorities and such others as it may deem proper, for the purpose of obtaining information relative to criminal abortion, to publish in documents and newspapers all things relative thereto proper to be published, and that physicians, sanitarians, educationists, social scientists, civil authorities and others be requested to communicate to the Board all information in their possession relative to the same, and that the clergy and press be earnestly solicited to acquaint themselves with the subject and to educate their hearers and readers as to the causes, prevalence, consequences and moral depravity of this the great curse of the nineteenth century.

EDWARD COX,
H. O. HITCHCOCK,
S. S. FRENCH,
Committee.

DISCUSSION.

Rev. J. Morgan Smith, of Grand Rapids, said:—

MR. CHAIRMAN:—I was about to say that I think the statements might be modified in some respects. I hardly think we can say that this is the great crime of the nineteenth century. Somebody gets up the next minute and says intemperance is the greatest crime, and so we have a half-dozen of the greatest crimes of the nineteenth century. Bishop Cox and other bishops and clergymen of the Episcopal church have, by authority, issued pastoral edicts against this crime. I believe there is a great deal of private teaching among the Protestant clergy about the crime and evil consequences of this matter I speak for the Protestant clergy of this State, that we are not deficient in boldness. We are willing to state to our congregations what we think to be right. Were we certain always of the course to take upon this and other things we should do as requested in the paper. There are obvious reasons why the pulpit should not be always used to denounce crimes of this nature. To do it continually would be to turn the pulpit and church into a place that many people would not like to visit. It would involve people into matters that would be better treated in privacy, if we should have to give our reasons. Therefore, Mr. Chairman, I hope the committee will modify some of its language, which seems to imply that the whole clergymen of this country are derelict in the matter.

Dr. Edward Cox, chairman of the committee, said:—

The committee believes every word of it. My own bishop, one of the best of men, has written me that "there are so many evil doings in this world of ours that even one who lives to avert the evil and make the world better may not more than notice glaring ones. It has been so with me with regard to abortion. I have known it as a crime prevalent and increasing, but beyond this, it has not had my attention."

In a practice of more than forty years, and a professional attendance of the mothers of more than three thousand children, I have never known the crime perpetrated by a Catholic woman, I made that statement in Detroit in a paper read about three years ago. Dr. Klein informed me he had known it done a few times, but very rarely by Catholics. I think the faithful ministrations of the Catholic clergy have much to do in preventing the crime. I believe the minister who neglects his duty in this respect is as much to blame as the surgeon who neglects to tie the severed artery. In a correspondence with nearly two hundred physicians, statements had been made that seventeen per cent of all pregnancies ended in abortion, and that in the United States six thousand women lost their lives annually. For this reason the committee called it the great crime of the nineteenth century. The committee would perfect, if possible, some means for the suppression of the crime as expressed in the resolution. I have no disposition to injure any one, but would ask the convention to adopt the resolution only which was agreed to.

Rev. D. C. Jacokes, of Pontiac, said:—

I do not believe there are any clergymen who are derelict upon this subject. The people want information upon the subject. I study almost everything that comes within my range, but I have found out that there are so many things I never heard of, that I begin to believe I will die without knowing everything. I believe this is so with my brother ministers. They are not placed in circumstances where they can get information upon this subject. It is a very difficult thing to do. The resolution asking the Board of Health to get information upon the subject is just what we want. I am prepared to trust women anywhere, as a rule. I have confidence in them and have become acquainted with them from the lowest inhabitant of the earth to the most cultivated. I can trust them. They want information just as I do, and I think the statements made by that committee are fearfully true with regard to the fearfulness of the destruction of life all over this country. Everybody does not know that, many physicians do not know it. We want information.

Rev. Mr. Barnes said:—

I agree very heartily with what Bro. Smith has said. I want to speak from the standpoint of a clergyman for a single moment. I don't like to have that in the report that the average clergyman is ignorant touching this matter. I do not believe it. No clergyman with ordinary good common sense, with ten years' experience, is supposed to be in ignorance touching this matter. He is with the undertaker. He is with the physician. He buries the dead. He knows what these cases are. He is not in ignorance,—if he is, he is unfit for his position. The matter of propriety is the only thing. I have felt this for years. I have read, and read, and read again, and read for months the reports that are sent me on this subject, but there comes in this difficulty. There is a sense of propriety. There is a question as to what is just right in this matter. Whether it is in the promiscuous audience it is to be presented or whether it is to be regarded as something that shall be talked more privately. There is the difficulty in my mind, and when the Doctor says we are to blame then I object with the rest.

Dr. Cox called upon Judge B. F. Graves, of Battle Creek, who spoke as follows:—

MR. PRESIDENT:—I fully agree with the gentlemen who have addressed you upon the importance of the resolution which is proposed to be adopted by the convention. The subject is one of immense importance.

It is not simply important so far as our physical health is concerned, but it is transcendentally important in so far as it respects our moral health. I believe that the people generally, often those who bestow some attention upon this subject, fail, at least, to regard it as it should be regarded. They do not ascribe to it all the importance which really belongs to it. To me, the growth of this vice, for the last twenty-five or thirty years in this country is an alarming sin, so far as our civilization is concerned. Anybody who is conversant with the history, or opinion of the times, with the history of former civilization, must be well aware how the people go from step to step, from considerable elevation, to the lowest degradation in this terrible progress. One of the most marked sins, one of the greatest sins, one of the sins which stands out, and upon which most stress may be laid, is the growing prevalence of this very vice.

I do not get up here for the purpose of saying much upon this subject, because I am not prepared to do so; but it seems to me that no man, who has been a mere member of society for the last thirty or forty years, who has bestowed any observation at all upon what is passing, no matter whether he be a doctor, lawyer, or mechanic, or whatever may have been his business, or position in society, can have failed to become aware of the growing prevalence of this vice. It seems to me if a man does not know it, he must have closed his eyes against all the signs, all the circumstances, all the evidences about him. So far as I am concerned (and I do not wish to dwell upon mere words, because they are of little consequence), I would not utter a word here that would be injurious to the feelings of any upright, honest citizen.

The necessity for instruction on this subject, not only such instruction as the physician imparts, but moral instruction is absolutely indispensable. Why, there are murderers all over this country, who have no idea at all that anything wrong is involved in this thing we call a crime, because they think that they are perfectly justified under many circumstances in doing what they do. They have the idea that they must preserve their place in society, the idea if they do not, it is just to do something of that sort or they will lose their position in society, that they will be degraded, they will be disgraced. Here is a person who has an apprehension that he cannot support his growing family, therefore he must be privy to a crime. He does not so regard it, but it is necessary that the sensibilities of these persons must be touched if they are to be informed; that their souls shall be touched as with a coal from the altar of God.

It is in vain to put laws upon the statute book, unless you have somebody to enforce those laws—unless they can be carried out. You must, in the first place, enlighten the community so that they will realize the importance, the utility, the value and justice of those laws before they can be carried out. Who is to carry them out in this country? The people. Who are the people? These very persons whose consciences and hearts are callous. In regard to this sort of crime they must be instructed. They must be made to see that it is murder and nothing else, and then there will be comparatively no difficulty at all in enforcing the laws upon the statute book. The community will do that. After some experience upon the bench, I will say, so far as the difficulty is concerned: It is not due to the laws or the legislature, but it has been in the state of public opinion behind that law.

The resolution was then adopted.

FIFTH SESSION, WEDNESDAY EVENING, AT 7:30.

The first paper of the evening was by Geo. E. Ranney, M. D., of Lansing, Secretary of the State Medical Society, on The Health Service of a State. The paper is as follows:—

THE HEALTH SERVICE OF A STATE.

BY GEO. E. RANNEY, M. D., OF LANSING, MICHIGAN.

As the dominion divinely given to man over the earth was established by conquest, so only by continued conquest can it be maintained. Under favorable influences the elements with which he comes in contact minister in manifold ways to his pleasure and profit, and give him health, strength and life. Under unfavorable and abnormal influences they work to his discomfort and injury, and are the sure occasion of disease and death.

"It is not air,
That from a thousand lungs reeks back to thine
Sated with exhalations rank and fell,
The spoil of dunghill and the putrid thaw
Of Nature: when from shape and texture she
Relapses into fighting elements."

So says John Armstrong, the physician and poet, whose "Art of Preserving Health," did more to popularize hygienic information than did old Dr. Buchan in his "Domestic Physic," and all works of a similar kind down to the present time. Doubtless the medical profession, as such, has been rather reluctant in coming to the study of the true principles of sanitation, but that reproach is well nigh wiped away, and they are now in the front rank. If Beaconsfield is right, that "the health of the people is the first duty of the statesman," especially is it the first duty of the physician. The prevention of disease may not be so profitable in the way of fees as the care of it, but on this account it is all the more honorable. To have such knowledge of natural laws, as to bring her forces into tune and harmonious relation, with the increase, the preservation, the happiness and longevity of the race, is one of those triumphs of science that has been reserved for this last and most glorious day.

The simple truth is, that from the very beginning, civilization and sanitation have gone hand in hand. The ceremonial laws of Moses are full of it. Hippocrates, in Greece, gave it the chief prominence in his teachings. So did Galen in Asia. Who was better acquainted with the value of drainage, and of pure water and of proper ventilation, as conducive to health, than the ancient Romans? Prof. Liebig even goes so far as to say that no people and no nation on the earth have thus far avoided their own decline and destruction, save those understanding the conditions of their existence and increase.

Hitherto one of the main barriers to sanitary progress has been superstition. As one of the many instances that might be cited, take a recent translation of the Report of the Sanitary Bureau of the Imperial Japanese Government. In reference to dysentery, diphtheria, typhoid fever, small-pox, cholera, and other malignant diseases, it says: "These diseases are well-known and recognized by the people as extremely dangerous; but the utmost superstition still prevails respecting the proper means of guarding against them. The lower class still believe enchantments or supplications to the gods to be the only efficacious remedies. Therefore, when an infectious disease breaks out, or is imported, it often spreads without check over the whole country."

It may be said that all knowledge is slow to be appreciated, but in our own State may be found those who oppose vaccination as a means of preventing small-pox, those who deny the contagiousness of scarlet fever and diphtheria, even among practitioners of medicine in some of our respectable towns, and all this when by prompt and vigorous measures the disease may as surely be stamped out as a spark under the foot.

These things, however, are becoming the rare exceptions to the general rule of sanitary progress. Public opinion is rallying to the support of such measures as may be deemed wise and expedient by intelligent authorities, and whenever the exigency demands it, their intervention is expected and cordially endorsed.

The world is now almost exempt from the ravages of small-pox, a disease which, being introduced into Mexico in 1520, spread throughout the continent, destroying three and a half millions of people, and which, in Ireland, in 1707, destroyed one-quarter of the entire population, and which nearly depopulated Greenland in 1733. Previously to the discovery of vaccination, nearly all in England were expected to have the disease, and that one-tenth of the entire population would die of it. Macaulay, writing of this time, says:

> That disease, over which science has since achieved a succession of glorious and beneficent victories, was then the most terrible of all the ministers of death. The havoc of the plague had been far more rapid; but the plague had visited our shores only once or twice within living memory; small-pox was always present filling the church-yards with corpses, tormenting with constant fear all whom it had not yet stricken, leaving on those whose lives it spared the hideous traces of its power, turning the babe into a changeling at which the mother shuddered, and making the eyes and cheeks of the betrothed maiden, objects of horror to her lover. During the century previous to the discovery of vaccination, small-pox is calculated to have destroyed 45,000,000 of the people of Europe.

In the time of the great medical author Sydenham (1624–87) the largest part of the mortality of London was produced by four diseases—plague, small-pox, scurvy and dysentery. Of these, the first has long disappeared from Great Britain and the continent of Europe; the second has been, by prevention, shorn of most of its destructive power; the third is now seldom known except in places remote from civilized life, and the fourth is at least much less fatal than formerly. Macaulay in his history of England, estimated that the difference between London in the seventeenth and nineteenth centuries was as great in regard to mortality, as between that of the time of the prevalence of epidemic cholera, and that of ordinary years.

In France in 1772 the annual death-rate was one in 25; in 1846, one in 45. The expectancy of life in Geneva in the sixteenth century was eight or nine years; in the nineteenth century, forty to forty-five years. It is estimated that during the last fifty years the average of life has been prolonged twenty-five to forty per cent, and this period is subsequent to Jenner's discovery of vaccination which was eighty-three years ago.

So despite the hindrances that have heretofore beset the advancement of State Medicine, through a want of the support of public opinion which controls the ruling powers, it is now gratifying to note its advancement among the most civilized people and the encouragement and substantial support given it by the general government.

Take but a brief resumè of what has been done by our own State Board of Health, and it will be seen that the advancement and practical results of sanitation have engaged public interest in our own State to a greater extent than ever before. Its triumph has but just begun.

I feel that I cannot do better in this paper than to review some of the important publications by our State Board of Health, and, in commencing, will notice one entitled

POISONOUS WALL PAPERS.

One of the first subjects undertaken by this State Board of Health was the study of the extent to which wall papers were colored with poisonous pigments and the extent to which sickness was caused thereby. One result of this work is stated in the following paragraph quoted from the report of Hon. Casey Young to the United States House of Representatives on the Adulteration of Food:

> "The Michigan State Board has published a book containing seventy-five representative specimens of these papers, and by order of that Board it has been put into every important public library of Michigan, as a warning to the people of that State. It bears the very appropriate title of 'Shadows from the Walls of Death.' This book states that these papers are sold in every city and important village of that State, and that their use is increasing. It advises (1st) to use no wall paper at all; (2d) never to use wall paper without first having tested it for arsenic; and (3d) if arsenical paper is already on the wall and cannot well be removed, then (as some protection) to cover it with a coat of varnish."

The statement that the use of arsenical wall paper was increasing was made some time ago when the Board began its work on that subject, and it is now believed that the use of this paper has decreased, because of the more general knowledge of the danger. People are more cautious in purchasing wall papers, and its use for similar reasons is sometimes avoided.

LEAD-POISONING BY USE OF TINNED WARE, AND OF VESSELS CONTAINING LEAD.

This is the title of a paper written by Dr. Kedzie, and printed in the Report of the Board for 1878. It is based upon experiments which show the extent of the adulteration of tin by lead, and it points out in strong and effective terms the dangers arising from the use of such ware as cooking-utensils, etc., and cites numerous instances where their use has produced effects which have, at first, been mistaken for some obscure chronic disease. In the same paper a simple and sure test for lead in tinware is given, by the use of which it is believed many persons have avoided purchasing dangerous utensils. The test has been copied largely in sanitary reports and journals, and has become well-known. Experiments were made with the so-called "Marbleized Ware," and the results as published in the paper referred to have led to an improvement in that class of goods. It has been stated that soon after this paper by Dr. Kedzie was published and public attention attracted to the subject, a manufacturer or wholesale dealer in such wares called in all the stock containing lead, scattered about the country from his store. Even wash-hand basins, from which the danger was not great, were called in, and similar goods free from lead were substituted; thus the public now have the benefits of the improved utensils without the risk of poisoning by lead.

ADULTERATION OF TABLE SYRUPS.

The attention of the Board was called to some syrup which it was believed, caused a large number of cases of illness. The syrup was analyzed and found to contain poisonous ingredients as adulterants. This led to a general examination of the subject, and Dr. Kedzie made a number of analyses by which the danger from poisonous adulterants in table syrups was shown. These analyses were incorporated in a paper which was published in the Annual Report of the Board and has been widely copied. Recent analyses of syrups sold in the stores indicate that one result has been that even syrups which are adulterated with glucose are not poisonously adulterated as before.

ILLUMINATING OILS.

The history of the legislation providing for the inspection of illuminating oils shows that when the State Board of Health was organized there existed upon the statute book a law requiring a flash test of 150° F. for illuminating oils. This law was not successful because its enforcement was entrusted to irresponsible persons, not residents of this State. The law was not effectual, and deaths from kerosene explosions were horrible and frequent. The Board immediately recognized this as a great danger to life in the State, and in its official capacity as the guardian of the health and lives of the people of this State, it began to publish articles to influence action up to the point of securing a safe law, and its intelligent enforcement. To that end almost complete success came, and for years scarcely a life was known to have been lost by the explosion of kerosene inspected and branded in this State in accordance with its law. Comparative safety made the people forgetful of past horrors, and the Legislature in 1879 reduced the test to 120° F., and abolished the chill-test. Even this law retained a greater degree of safety than was ever reached before the vigorous action by the Michigan State Board of Health.

SAFETY IN PUBLIC ASSEMBLIES.

Agitation of this subject by the Board (pages 15–20, Report of the Board for 1876) led the Legislature to pass a law requiring the doors of all churches, public halls, school-houses, etc., to open outwards, and though no case has yet come to our knowledge where this has been useful in saving lives, yet every intelligent person can readily see that it is a wise provision which it is not necessary to have a holocaust to demonstrate.

LOCAL BOARDS OF HEALTH.

Perhaps the most important usefulness of a State Board of Health is in stimulating to activity the health authorities in every part of the State. The theory of the health service of this State is that each township, city, and village must act for itself, and in each such community the local board of health is endowed by law with great power for the protection of the health of persons within its jurisdiction. The law providing for local boards of health has been on the statute books since the organization of the State, but previously to the establishment of the State Board of Health, there was no central authority, no head, and the law was in most cases inoperative. When the State Board of Health was established, there was scarcely a working local board of health in the State. Now, the facts are different, because of the organizing and stimulating action of the State Board of Health. In nearly every city, village, and township in the State there is an organized, working board of health. In many of these the boards are very active and exert great power for good. Many instances can be given, but one very notable one must suffice at this time, namely the action of the local board of health of the township of Bunker

Hill, in Ingham county. Diphtheria was brought into the township by a visitor in a family in which there were several children; all of them were exposed and died of the disease, it being of great malignancy. The local board of health, by prompt and efficient action, kept the disease from spreading, and confined it to that one house. This is in marked contrast with what occurs in States or localities where prompt action is not taken for the restriction of the disease.

RESUSCITATION OF THE DROWNED.

Some years ago a document was planned by members of the Board giving a method for resuscitating persons apparently drowned or suffocated. This document was illustrated by cuts practically showing the manner of manipulating the body of the person treated, in such a manner as to restore breathing and life. They were printed as posters for placing on docks, wharves, boats, etc., and as a small vest-pocket pamphlet. They were sent to each school district in the State, and were otherwise widely distributed, somewhat among sailors on the great lakes. That the use of the method recommended in these documents has saved the lives of several persons is positively known.

THE RESTRICTION AND PREVENTION OF SCARLET FEVER.

In April, 1877, the Board issued a document calling attention to the fact that scarlet fever was a contagious disease and giving the best known methods for its restriction and prevention. The Board also issued a circular to its correspondents, asking sixty-six questions relative to the causation and prevention of scarlet fever. At this time it was believed by very many persons not to be a contagious disease. In reply to the circular a great many valuable answers were received, giving facts concerning the disease in this State entirely in harmony with those on which had been based the document on the Restriction and Prevention of Scarlet Fever. The facts and others communicated by correspondents were published in the Annual Report of the Board, as was also the document issued by the Board, and this was also reprinted in large numbers and scattered widely over the State; copies were also sent to each township library. This document taught the contagious nature of the disease, and within a few years the theory then somewhat prevalent of its being non-contagious has changed, and I think it will be difficult now to find any intelligent person who does not know that the disease is a contagious one. It is believed that the sickness from this disease has materially decreased, because of greater efforts by parents to keep children from contracting it, and by local boards of health to restrict its spread.

A work similar to that performed for scarlet fever has been done by the Board for diphtheria, but owing to the lack of means the document has not been as widely distributed, but it has proved itself to be a valuable aid in teaching the most efficient known means of restricting the disease.

Scarlet fever and diphtheria are preëminently diseases of children. The mean age at which they die of scarlet fever in England, according to Dr. Farr's calculations, is five and eight-tenths years. As it is the large mortality of children that swells the death-rate, how easily and how certainly might this terrible rate be lessened by keeping them from undue exposure. The voice of Rachel weeping for her children would then indeed be much more rare.

RESTRICTION AND PREVENTION OF SMALL-POX.

July 10, 1877, at a regular meeting of the Board, resolutions were adopted expressing the sense of the Board, that small-pox could be prevented by vaccination and revaccination, and recommending that local boards of health offer free vaccination to the inhabitants of their jurisdiction; and these resolutions were printed on a leaflet together with the name and address of a person of whom reliable bovine vaccine virus could be secured, and the distribution of these leaflets was made very thorough all over the State. In 1879 the law was passed which secured the further

PREVENTION OF SMALL-POX BY VACCINATION.

Through the efforts of the Board a law was passed in 1879, permitting boards of health to furnish vaccination with bovine virus free to all applicants as often as once in each year, and this was recommended by the State Board of Health. Many townships and villages are taking advantage of this law, and if a wide-spread epidemic of this loathsome disease does not occur in the near future, it may fairly be attributed to the increased number of vaccinated persons, for cases are reported in different parts of this and other States sufficient, apparently, to furnish contagium enough to cause epidemics if it were not that so many are vaccinated by physicians and health officers.

LEGISLATION IN THE INTERESTS OF PUBLIC HEALTH.

With a system by which all local boards of health in a State act under and are governed by uniform laws, it is necessary that those laws should be as perfectly constructed as is possible. Ever since the organization of the Michigan State Board of Health there has been among its standing committees one on legislation in the interests of public health. The work of this committee has been constant and productive of improved laws for the government of the health service of the State.

DRAINAGE.

The fruits of the labor of Dr. Lyster in preparing several papers on this subject have been seen in several parts of our State, where large property owners have reclaimed hundreds of acres of land by adopting methods of drainage suggested by him in his papers on that subject. The influence of his papers has extended into many townships, and awakened interest and action in not a few instances.

QUOTATIONS RELATIVE TO WORK OF THE BOARD.

A few extracts which serve to show the reputation in which the Michigan State Board of Health is held at home and abroad, I do not think will be out of place to mention in this paper.

From a review of the Report of the Board for 1877 appearing in the *American Journal of Sciences* for January, 1879, is quoted the following:

> "There are a few points in regard to which the Michigan Board need fear no comparisons. Its managers seem to have remarkable tact and facility in so devising and constructing forms and circulars as to reduce to an almost incredible minimum the labor of responding to the inquiries thus made. * * * Another matter in which the Board excel is the preparation of brief tracts for circulation among the people."

From a review of the Report for 1874, appearing in the *Detroit Review of Medicine and Pharmacy* for June, 1875, is quoted:

> "In our judgment this Report reflects great credit upon the Board and compares favorably with similar Reports by other State Boards."

Of the "Fifth Annual Report of the Secretary of the State of Michigan, relating to the Registry and Return of Births, Marriages, and Deaths for the year 1871," the editor of the *Cincinnati Lancet and Observer* for January, 1875, says:

"This volume, for it is a book of 376 pages, was prepared under the immediate supervision of Dr. H. B. Baker, the very efficient secretary of the State Board of Health, and superintendent of Vital Statistics. The report is a practical demonstration of what can and what ought to be accomplished in every State in the Union. As a book of reference as to vital statistics it is invaluable. We have a profound admiration for the practical interest in this subject shown by the medical profession of our sister State, and hope her legislators may ever have the wisdom to co-operate with them in the good work."

In the *North Carolina Medical Journal* of November, 1878, in speaking of the Report of this Board for 1877, it is said:

"It is difficult to make a satisfactory review of a work so full and so varied as this Report of the Michigan Board of Health. It is at the same time a most creditable frame-work of a science in its formative stage, and a careful record of work done by conscientious officers for a generous State. * * * This, with the Massachusetts Reports must be our text books for some time to come, and we long for the day when North Carolina can boast of so useful a piece of machinery as the Michigan Board of Health."

The *Sanitary Record* of London, England, in an extended notice of the Report of this Board for 1878, says, in its issue of April 18, 1879:

"The sixth annual Report of the secretary of the Michigan State Board of Health affords a good example of State Medicine and its administration as it is carried out by our American cousins. * * * As sanitary advisers, the State Board, through its indefatigable secretary, seems to have put itself in communication with every township and its health officer in the State, reminding them of their broad duties, and demanding, as it appears to have the legal right with certain regular returns and information as to births, deaths, and marriages, and as to the prevalence of diseases dangerous to the public health. In addition to this, the State Board diffuses general and special sanitary information from time to time as occasion offers or requires. * * * Space will not allow further remarks, but it is impossible to overrate the importance and interest of these American State Medicine Reports, or to exaggerate the interest and usefulness of their contents."

The official paper of the French Society of Hygiene, the *Journal D'Hygiene*, Paris, December 16, 1880, says:

"The State Board of Health of Michigan, is placed without contest, among the most active and zealous of Sanitary Bureaux."

From an editorial in the *Detroit Lancet* for March, 1881, I quote the following:

"We have the very best Board in the United States, and by providing liberally for its needs in the prosecution of its work we shall reap far richer returns in the future. Horses well fed and housed and otherwise well cared for do the very best work before the carriage, the cart, the car, or the plow. Brain work, such as comes within the province of this Board, surely should be well paid. We are in no ways connected with the Board, and hence speak in the capacity of a private citizen. Let us give the Board all materials to work with that it can possibly utilize to good advantage."

ARTICLES PREPARED AND PUBLISHED UNDER THE DIRECTION OF THE MICHIGAN STATE BOARD OF HEALTH.

TITLE OF ARTICLE.	AUTHOR.	REPORT FOR,	PAGE.
1. Address, Introductory	Hitchcock	1873	4
2. Alcohol, Entailments of	Hitchcock	1874	3-32
3. Air Moistening		1880	146-8
4. American Social Science Association—Review of the Proceedings of the Health Department of, etc.	Baker	1876	63-70
5. American Social Science Association—Review of the Proceedings of the Health Department of, etc.	Parker	1877	91-98
6. American Social Science Association—Report of the Proceedings of the Health Department of, etc.	Kedzie	1878	47-52
7. American Public Health Association—Report of the Proceedings of	Hitchcock and Baker	1877	449-457
8. American Medical Association—Public Health Subjects in Proceedings of	Hitchcock	1878	15-23
9. Baths and Bathing	Lyster	1877	111-130

ARTICLES PREPARED AND PUBLISHED.—CONTINUED.

TITLE OF ARTICLE.	AUTHOR.	REPORT FOR,	PAGE.
10. Cancer not caused by the use of Tomatoes	Hitchcock	1878	33-38
11. Cerebro-Spinal Meningitis	Baker	1874	115-193
12. Circulars Numbered 1, 2, and 3	Baker	1873	8-17
13. Circular [6]	Baker	1875	xxxviii-xxxix
14. City of Destruction	Kedzie	1880	72-81
15. Climate and Topography of the Lower Peninsula of Michigan	Lyster	1878	167-210
16. Cosmetics	Yemans	1880	102-103
17. Coroners and Coroners' Inquests	Parker	1878	311-320
18. Consumption, Pulmonary, Prevention of	Lyster	1880	30-39
19. Cooking	Ballard	1880	156-9
20. Cookery, Training Schools of	Jenison	1880	86-90
21. Criminal Abortion, Report on	Hitchcock	1876	53-62
22. Danger near Railroad Switches	Worsfold	1877	459-464
23. Decomposing Wood as a cause of Disease	Kellogg	1880	213-220
24. Diphtheria, Report of three Epidemics, and Document Relative to the Restriction and Prevention of		1878	75-89
25. Diphtheria, Contributions to the Study of Spread of, Report of a Special Investigation of, Replies by Correspondents, etc.		1877	251-390
26. Diseases in Michigan During the Year 1875	Prominent Physicians.	1876	141-178
27. Diseases in Michigan, 1875	Prominent Physicians.	1876	xxxii-xxxix
28. Diseases in Michigan, 1876	Prominent Physicians.	1877	167-236
29. Diseases in Michigan, 1877	Prominent Physicians.	1878	105-165
30. Diseases in Michigan, 1878	Prominent Physicians.	1879	147-132
31. Diseases in Michigan, 1879	Prominent Physicians.	1880	10-13
32. Diseases which Endanger the Public Health		1879	261-268
33. Drainage, The Influence of, etc.	Lyster	1875	147-160
34. Drainage for Health	Lyster	1874	41-53
35. Drinking-Water, Contamination of	Vaughan	1880	10-13
36. Drowned, Resuscitation of the	Kedzie	1874	88-99
37. Drowned, Persistence in Efforts to Resuscitate the	Kedzie	1877	131-142
38. Duty of the Christian to the Laws of Health	Smith	1880	136-140
39. Duties and Compensation of a Health Officer	Parker	1879	139-146
40. Drowned Lands, Reclaiming of	Lyster	1879	233-260
41. Editors in Michigan, Circular asking Co-operation of		1876	xxxii-xxxix
42. Epidemic Scarlet Fever at North Lansing	Marshall	1876	41-53
43. Epidemic, Endemic, and Contagious Diseases, etc.	Hitchcock	1879	103-137
44. Erysipelas, and Puerperal Fever, Report Relative to		1877	347-350
45. Failure to Prevent Deaths believed to be Preventable, and the Reproduction of the Disease Germs	Baker	1875	78-83
46. Food, Adulteration of	Jungk	1880	90-96
47. Fevers, Periodic	Nicholson	1880	191-212
48. Glanders in Man and in Domestic Animals	Baker	1879	301-334
49. Health, Relation of Schools to	Goodman	1874	63-87
50. Health of the Young, as Affected by School Architecture, etc.	Strong	1880	166-176
51. Healthful Dwellings	Lyster	1877	47-67
52. Heating and Ventilating Private Dwellings, and Public Buildings already Constructed	Jacokes	1879	51-62
53. Heredity	Hitchcock	1877	1-19
54. Human Excreta, the Disposal of, etc.	Hitchcock	1875	55-77
55. Hygiene of School Buildings	Kedzie	1873	65
56. Hygienic Science and Art, Achievements of	Hitchcock	1876	1-13
57. Household Filters, Use of	Prescott	1880	61-69
58. Illuminating Oils	Kedzie	1873	34
59. Illuminating Oils	Day	1875	84-103
60. Illuminating Oils in Michigan	Kedzie	1877	69-80
61. Illuminating Oils in Michigan, Inspection of	Averill	1877	85-90
62. Illuminating Oils, Historical, relative to Inspection of	Kedzie	1879	1-14
63. Infant Diet, Remarks on	Hazlewood	1877	99-104
64. Inflammability, Some Conditions of	Kedzie	1880	176-183
65. Labeling Medicines	Kedzie	1877	21-26
66. Lead Poisoning from the use of Tinned, Glazed, and Enameled Ware	Kedzie	1878	25-31
67. Lectures on Public Health at the University of Michigan	Lyster	1878	99-103
68. Light in the Public Schools, etc.	Lundy	1880	20-29

ARTICLES PREPARED AND PUBLISHED.—CONTINUED.

	TITLE OF ARTICLE.	AUTHOR.	REPORT FOR,	PAGE.
69.	Local Boards of Health, Circular Relative to Duties of	Baker	1874	xi-xvi
70.	Local Boards of Health, Circular to Clerks of	Baker	1874	xviii-xix
71.	Local Boards of Health	Hitchcock	1875	1-10
72.	Local Boards of Health, Powers and Duties of	Parker	1879	289-300
	Local Boards of Health, Circular to the Clerk of	Baker	1873	9-10
	Local Boards of Health, Circular to the Clerk of	Baker	1873	16-17
73.	Means of Escaping from Public Buildings in case of Fire	Kedzie	1876	15-20
74.	Meteorology of Central Michigan	Kedzie	1874	195-213
75.	Meteorological Conditions in Michigan, 1877	Baker	1878	211-250
76.	Meteorological Conditions in Michigan, 1878	Baker	1879	335-394
77.	Meteorology, 1879	Baker	1880	303-363
78.	Neurasthenia	Rouse	1880	58-61
79.	Occupations, the Influence of, upon Health	Brigham	1875	38-54
80.	Opium Habit in Michigan, The	Marshall	1878	61-73
81.	Ozone	Kedzie	1875	133-146
82.	Ozone, Atmospheric	Nicholson	1880	285-302
83.	Ozone in Nature	Mulvany	1880	277-284
	Physicians in Michigan, Circular to	Baker	1873	11-12
84.	Poisonous Paper	Kedzie	1873	60-64
	Poisonous Paper	Kedzie	1874	53-62
85.	Poisons in Agriculture, The use of	Kedzie	1875	11-25
86.	Public Health Subjects in Proceedings of the State Medical Society at Lansing, 1878	Baker	1878	53-59
87.	Preservation of the Teeth	Farnsworth	1878	91-98
88.	Privies and Water-closets at Railway Stations	Hitchcock	1879	15-24
89.	Prevention Better than Cure	Veenboer	1880	143-145
90.	Prevailing Diseases in Michigan, Circular Relative to		1876	xxxii-xxxix
91.	Public Schools, Unsanitary Conditions of	Corbin	1880	185-190
92.	Recreations and Health	Brigham	1877	27-46
93.	Regulation of the Practice of Medicine	Parker	1879	45-50
94.	Sanitary Inspection of Certain State Institutions	Kedzie	1874	101-114
95.	Sanitary Council of the Mississippi Valley, National Board of Health, and American Medical Association, Memphis and Atlanta Meetings	Kedzie	1879	25-44
96.	Slaughter-houses, Rendering-establishments, etc.	Hitchcock	1879	63-80
97.	Sanitary Associations	Kellogg	1879	81-95
98.	Sanitary Science, Methods of Study in	Caulkins	1880	16-20
99.	Sanitary Conventions, Introduction to		1880	3
100.	Sanitary Convention, Detroit—			
	President's Address	Brodie	1880	7-10
	Reports of Committees		1880	103-107
	Welcoming Address	Kedzie	1880	6
101.	Sanitary Convention, Grand Rapids—			
	Opening Address	Kedzie	1880	113-114
	President's Address	Gillespie	1880	115-120
	Reports of Committees		1880	149-150
102.	Sanitation, General, etc.	Baker	1880	120-135
103.	Sanitary Rewards and Punishments	Lord	1880	39-46
104.	Sanitary Reform, Relation of the Clergy to	Conover	1880	150-156
105.	School Hygiene	Sill	1880	96-101
106.	Sewerage System of Detroit	Craig	1880	46-54
107.	Sewerage of the City of Grand Rapids	Sekell	1880	140-148
108.	Sewerage at the State Public School	Randall	1880	160-166
109.	Supply of Milk in Cities	Watkins	1880	82-86
110.	Small-pox in the City of Detroit	Lyster	1877	105-109
111.	State Board of Health, Work of the	Kedzie	1878	1-14
112.	State Board of Health, Abstracts from Proceedings at the Meetings of	Baker	1877	liv-lxiii
113.	State Board of Health, Abstracts from Proceedings at Meetings of		1878	xlix-lix
114.	Scarlet Fever, Document on the Restriction and Prevention of		1877	xxix-xxxii
115.	Table Syrups, Impurities and Adulterations of	Kedzie	1874	33-40
116.	Trichinæ and Trichiniosis	Hazlewood	1875	26-27
117.	Texas Cattle Disease	Murray	1880	14-15
118.	"Treatment of the Drowned," Circular on		1876	xxxii-xxxix
119.	Vaccination	Hazlewood	1876	21-40
120.	Ventilation, Principles of	Parker (Thomas A.)	1880	55-58

ARTICLES PREPARED AND PUBLISHED.—CONTINUED.

TITLE OF ARTICLE.	AUTHOR.	REPORT FOR,	PAGE.
121. Ventilation	Billings	1880	69-72
122. Ventilation of Dwelling-houses	McLeod	1880	55
123. Ventilation of Railroad Cars	Kedzie	1876	130-140
124. Vital Statistics, Methods of Collecting	Baker	1876	121-130
125. Water-Supply, Circular Relative to		1876	xxxii-xxxix
126. Water-Supply in its Relation to Health and Disease	Hazlewood	1875	105-132
127. Water and the Water-Supply in Michigan	Hazlewood	1876	71-80
128. Water-supply of Michigan	Kedzie	1876	107-119
129. Weekly Reports of Diseases in Michigan, 1877	Baker	1878	237-343 251-309
130. Weekly Reports of Diseases in Michigan, 1878	Baker	1879	395-508
131. Weekly Reports of Diseases in Michigan, 1879	Baker	1880	365-470
132. Weekly Reports of Diseases, Circular Relative to		1876	xxxii-xxxix
133. Wood Pavements and Wood Sidewalks, Concerning Influence of, on Public Health	Hitchcock	1878	39-46
134. Waste of Human Life—Falling of Grand Stand at Lenawee Co. Fair, etc.	Kedzie	1879	97-102
135. Work of Health Officers and Local Boards of Health, Circular		1879	269-278

In the history of the science of sanitation there have been important epochs, but perhaps none of them more interesting and important than that during the recent war for the Union. The study of hygiene was a military necessity, almost as much so as was the study of surgery. The coming together of men in large masses, where their habits and surroundings could be known, observed, and compared, led to close observation resulting in very valuable sanitary discipline, especially during the latter part of the war. Such discipline added to the health and efficiency of the army to an extent that could scarcely be credited except by an eye witness. The lessons of sanitation thus taught have not been forgotten. So we see that a large compensation in this way grows out of the war and

"From seeming evil still evincing good."

The work of sanitation since the war has moved on with rapid, and indeed unprecedented progress, and the results have been equally encouraging to the promoters, and beneficial to the public at large.

Organization is more than strength; it is power. Previously to the war there was no State Board of Health. The first Board was organized in Massachusetts in 1869. Between 1869–1873, three others were organized. In 1873 the Michigan State Board of Health was established. Since then, nineteen other States have found it their interest to found similar Boards. The remainder of the States, no doubt, will soon follow.

The full and practical study of hygiene pertaining to occupation, camp, mines, naval and merchant marine, food, seaport and inland quarantine, contagious diseases, disinfectants, etc., is vast in amount, and of vast importance.

But in order to bring this knowledge to every man's door we want more than national, more than State organizations. The establishment of village sanitary associations, would in my opinion prevent an incalculable amount of disease, and death, and orphanage. Philanthropic aid societies undoubtedly have their place and do a great deal of good, but for all practical purposes of prevention they usually come too late. These village associations would exert themselves in a social way. They would create the habit of sanitary observation. They would disseminate simple and undeniable principles. They would dissipate no little of the mysticism of ignorance, the witchery of superstition, and the brazen audacity of quackery. Potent elixirs and catholicons and nostrums of every kind would be advertised in vain, and, thus enlightened, persons would retain their health and their money too.

Such societies by essays, and members of such societies by conversation, might teach mothers that it is not necessary to give a child a dose of physic as soon as it is born, or feed it starchy sop that it could not possibly digest. They might show that the whole analogy of comparative anatomy proves that all animals require animal food for some time after birth; that the salivary glands of a baby are inactive, and hence, as the very first step in digestion the starch taken into the stomach cannot be converted into sugar. They might show that it is not necessary to wipe out the rose tint of the little innocent's cheek by resorting to the medicine chest, to Godfrey's Cordial, to Mrs. Winslow's Soothing Syrup; or, worst of all, to the dangerous advice of some "practical woman."

Such work by local sanitary associations would be a noble work in this country, as it now is in England, for persons of both sexes. Women who were informed and thoroughly intelligent on these subjects could lessen the death-rate of children to an extent which few can now scarcely dream. Children under five years of age now constitute about one-fifth of the whole population —and the deaths of such children forty-one per cent of the entire mortality.

There is room for philanthropy, for enterprise, for practical Christianity, towards the little ones. Here is an opportunity to secure the Master's reward, as though such kindness were shown to Himself.

The next paper was on Sanitary Rules *vs.* Medical Theories, by Hon. Foster Pratt, M. D., of Kalamazoo, and is as follows:

SANITARY RULES VERSUS MEDICAL THEORIES.*

BY HON. FOSTER PRATT, M. D., OF KALAMAZOO.

Under any form of government, good or bad, men, women, and children are liable to sickness and death. Under any form of government, people—especially the large aggregations of population in our cities and villages—are liable to live and they often do live negligently or ignorantly under conditions, or in such a manner, as to endanger their own health and lives, and, by their violation of the laws of hygiene, to become the victims and the diffusing agencies of pestilence. This is a public evil to be abated. This is a danger which, even under our form of government, the State not only may but it must avert. Hence, to prevent the importation of disease from abroad and to circumscribe it if introduced, we enact quarantine laws, and, to prevent the incubation or the diffusion of certain diseases at home, we enact laws to promote and to preserve public health. This is wise, humane, and right. It commends itself to every intelligent judgment. It is demanded by our natural desire to preserve the health and lives of ourselves and of all dear to us. It is also demanded by a sound and broad political economy, that cannot afford to lose, from the aggregate wealth and the productive resources of the State, the expense of needless sickness, nor the productive labor of those unnecessarily sick, nor of those who prematurely die. Such federal and State legislation seems to be so wise, necessary, and proper, that we, perhaps, assume universal acquiescence in and obedience to it. But, unfortunately, we find the efficient execution of such laws very difficult. The difficulties are very numerous and, at times, very formidable—almost insurmountable.

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*[A very interesting introduction relating to the influence of theories, read with this paper at Battle Creek, has, on the suggestion of Dr. Pratt, been omitted in printing the paper, in order to give greater prominence to the main facts of which the paper treats.—H. B. B., Sec. S. B. of H.]

Not attempting to enumerate, much less to discuss, all these obstacles, this paper will call attention to one or two difficulties, in the enforcement of our health laws, which spring up in the *medical profession* (so called), and which may be avoided by properly amending the law.

Diphtheria, one of the diseases "dangerous to public-health," and subject to legal regulation, will serve as a text for the illustration and discussion of the special points to which your attention is invited.

Nearly every community has doctors—good, bad, and indifferent—graduates and non-graduates—competent and incompetent—regular, homœopathic, eclectic, electric, vita-pathic, and uriscopic—not to mention the "Buchanan" article, made to order and on short notice. These are all practically equal before the law; and, because of that *legal* equality they are supposed to be equally able to give "an opinion as is an opinion." It is quite safe to assume that they all have pet theories about the nature, the origin, and the treatment of diphtheria. But, unfortunately, the theories of the best of them—of those generally admitted to be the best—do not agree. Some say it is sporadic, and these divide on the nature of the local cause. Some say it is epidemic and these disagree as to the epidemic cause. Some say it is infectious, but dispute about the nature of the infection and the mode of its diffusion. Some say it is contagious, and these differ on the time, circumstances, and conditions of its communication. Professional jealousies and rivalries, school differences and discords, individual eccentricity and obstinacy, and personal dislike of the local health officers, all add their influences to convert these theoretical differences, honest and dishonest, into a medical bedlam. It is quite easy to imagine how jealous and tenacious every medical theorist (certainly not less than any other kind of theorist) will be of his pet hobby—how he will ride it by day in the country and by night in the corner grocery—how he will strive to make converts to his doctrine and put money in his purse, by opposing or criticising the enforcement of the law in families and communities.

While, as a profession, we feel just pride in the fact that medical men are, everywhere, the leaders in hygienic reform and in all preventive medicine, it is mortifying to know that the obstacles, to the proper enforcement of our health laws, spring largely from those who, in popular estimation and by their legal status, are a part of the medical profession, and who, therefore, are supposed to be equally able, with the best of us, to guide or aid our legislators in the enactment of proper, wholesome, and practicable laws to protect the public health. Can these obstacles be overcome?

Your attention is now invited to a few sections and provisions of our public health act:

Sections 1734 and 1735 of Compiled Laws of 1871 require householders and physicians to report to the board of health or to the health officer of their respective localities, every case of "small-pox or any other disease dangerous to public health," under a penalty, in each case of neglect or refusal to do this, not exceeding one hundred dollars.

By sections 6852 and 6853 it is made the duty of all township officers to take notice of all neglect in this respect, and of the supervisors to prosecute the offending householder or physician.

By an amendment to the law, passed in 1879, it is also made the duty of the health officer, in each city or village, to give notice of such neglects, on the part of householders or physicians, to the prosecuting attorney; and by section 6855 it is made the duty of the prosecuting attorney to prosecute such offending householders and physicians for the penalty or forfeiture incurred.

These provisions seem, at first thought, and without careful study or some practical test of them, to be ample and efficient to secure the end in view. But unfortunately in a majority of cases, they will be found to be inefficient and inoperative. Let us suppose a case; and then trace it through the legal steps and proceedings necessary to a complete test of the practical working of these statutory provisions (bearing in mind, please, that *diphtheria* is the form of disease, "dangerous to public health," which is chosen as a text for illustration). A doctor or a householder in Battle Creek, refuses or neglects to report to your health officer a case or cases of diphtheria occurring in the family of the one or in the practice of the other. The health officer privately and politely calls the offender's attention to the legal requirements and penalty for neglect. (He is not required by law to do this, but for many reasons he is likely to give such notice.) The neglect or refusal, however, continues, and offenses in this respect multiply. Disease spreads—the public become alarmed—the health authorities are censured for inefficiency—something must be done. As required by law, the health officer at last gives notice to the prosecuting attorney of your county, that Mr. A. B., householder, or C. D., doctor, has not reported, as required by law, in cases of disease "dangerous to public health," and that there is a penalty or a forfeiture to be collected. The prosecuting attorney, thus informed, proceeds as the law requires, and files a complaint before a justice of the peace against the householder or doctor. A warrant issues; the defendant is brought into court; he demands a trial by jury, and the issue is joined. Proof for the people is presented, showing that the defendant had a case of diphtheria which he did not report as required by law, and that, being guilty as charged, he is liable for the prescribed penalty. The defendant, by himself or by counsel, admits that he did refuse or neglect to report a case of diphtheria, but denies that he is liable to the legal penalty. Some quibbling is, lawyer-like, thrown out in the opening to the jury, as to what the statute means by *public* health. The prevalent meddlesomeness of modern law-makers with private affairs and business is also portrayed, for the benefit of the jury; and finally he informs the jury that his client is not amenable to the penalties of the statute—(penalties that are well enough so far as small-pox is concerned), because *diphtheria is not a disease "dangerous to public health."* Having thus disclosed his main position, he proceeds to inquire what it is, in any given disease, that makes it "dangerous to public health." He informs the jury that single cases of diphtheria—or, as the doctors call them, "sporadic cases"—often occur without known exposure to contagion or infection and without spreading to other persons even in the same house or family. He also tells them that diphtheria is occasionally epidemic and springs up simultaneously in several different localities and without any possibility of tracing their origin to contagion. But so, he urges, do fever and ague, diarrhea and dysentery, diseases that are never reported or required to be reported. He lays it down to the jury as a common sense proposition, that a disease to be "dangerous to public health," must be, like small-pox for example, a *contagious* disease, and closes his opening to the jury by an appeal that twelve honest and intelligent men should administer a merited rebuke to all those law-makers and officials who, on such flimsy grounds, meddle in our private affairs, and when resisted, attempt thus to prosecute good citizens.

Having thus prepared the minds of an average jury for his purpose, he next introduces doctor after doctor (I say nothing of their quality), who swear that they do not believe diphtheria to be contagious, nor any more dangerous to public health than fever and ague or summer complaint. Neighbors and friends of the jury, who are not doctors, are also put on the stand, who swear that they do not believe diphtheria to be "catching," because they have known persons to have it without catching it and without giving it to anybody. Authorities to the same effect, old and new, good, bad, and indifferent, are then ostentatiously read and commented on for the enlightenment of the jury; and with this the defendant rests his case.

The prosecutor, in rebuttal, may or he may not introduce other medical and lay evidence to prove that diphtheria is contagious and is "dangerous to public health," and he may quote authorities also to support his case. The justice's charge (if he choose to give one) informs the jury that, if they find it proved, 1st, That the defendant had a case of diphtheria in his house or under his care, which, 2d, he refused or neglected to report to the health officer; and 3d, if it be proved to their satisfaction that diphtheria is a disease "dangerous to public health," then and in that case they will find the defendant "guilty." But, if the people have failed to prove any one of these three essential propositions, then and in that case they will render a verdict of "not guilty"; bearing in mind, that if the jury are in doubt whether the proof is sufficient to establish each or any one of the foregoing essential points, then and in that case the defendant is entitled to the benefit of the doubt. Now, my friends—especially my legal friends—what verdict will the average jury render in such a case? Approaching such a case as many jurymen will, jealous of what they call new and meddlesome legislation and of its enforcement, muddled and befuddled as they are likely to be on the trial, by conflicting evidence and authority, and with little ability to discriminate between the true and the false, because untrained by study or experience in this kind of inquiry—what, I repeat, will the verdict be? You anticipate the answer,—in a large majority of cases it will be for the defendant.

Assuming the case, now described, to have been the first one of the kind ever tried in Battle Creek, what, my legal friends, would be its effect on future complaints and future trials in similar cases? Is it not safe to say, that, in this city, such complaints will cease to be made, or, if made, the result of trial will be the same? And so, a law benevolent in purpose, and beneficent in effect, becomes a dead letter, because, for some reason, its violation cannot be punished. But who is there, in this audience, who thinks that such complaint and such trial should have such profitless result? Every intelligent person must be convinced, that such complaints, when well founded, should have a different and a more effective issue. If this be true, it will be interesting to inquire why a better result is not reached? What is the difficulty? What is the remedy?

It will be borne in mind, that it was agreed, on the case supposed to be tried, that there was a case of diphtheria and that it was not reported; and that the issue was joined only on the question, whether diphtheria is, or is not, a disease "dangerous to the public-health." Sanitary rules say it is, and certain doctors' theories say it is not: the real conflict, therefore, comes between sanitary rules and medical theories. Shall we ignore or suppress theories, or change the law? Which is the remedy?

It will not be supposed, that "medical theories" are a unit—that all doctors hold the same theories. The real parties to this issue (so far as it is a doctrinal issue) are all doctors. Sanitary rules, however, represent the opinions of the great majority of intelligent physicians, and the rules, so far as they become law, are based mainly on medical facts—not on medical theories of any sort. The opponents to the rules, or to the law and its enforcement, are, in part, doctors also; and they are wholly doctors, so far as mere medical theories inspire opposition. The question comes to us, again, shall we suppress theory or amend the law?

It is manifest that the theorizing propensity cannot be abated as a nuisance, however great a nuisance it, at times, may be. But we know that the legislature, if it will, can change the law, and we believe it will amend it when it is convinced what should be done.

How then can our public-health act be amended, so as to make it easy of enforcement, all medical and non-medical theories to the contrary notwithstanding?

The fundamental defect in the act, which makes it difficult if not impossible to prosecute and punish all who neglect or refuse to report these dangerous cases of disease, lies in this: the law fails (except so far as small-pox is concerned) to specify, enumerate and declare *all* the diseases—the other diseases—"dangerous to the public health," to which it is intended the provisions of the act shall apply. The real difficulty, in the imaginary trial, supposed to have occurred in Battle Creek, was this: the law does not declare that diphtheria is a disease "dangerous to the public health." This important fact—essential to the conviction of the derelict doctor or householder—by this omission of the statute, is left to be a *matter of proof* before the jury. The attempt to prove, to a jury, that diphtheria is a disease dangerous to public-health, will always be met, as we have described, by theory, and by proof, on the other side, that it is not so dangerous, and with what result we already know.

A complaint against a doctor or householder for not reporting a case of small-pox can be easily sustained, because this disease is specified by name in the law and declared by the law to be dangerous to the public health. If now, scarlet fever, diphtheria, typhus and typhoid fevers, malignant erysipelas and cholera were likewise named in the statute, as dangerous to the public-health, and like small-pox, to be regulated and managed by boards of health, then a violation of the law would be easy to punish, especially if mischief resulted from the neglect to report. The dangerous character of the disease being declared by statute, it would remain to prove on the trial only this: that the disease occurred and was not reported. In the trial of a case under the amended law, conflicting medical theories and opinions, testified to by witnesses or read from books called medical authority, would not and could not be introduced to confuse and confound the jury. The statute having declared diphtheria to be dangerous, proof on this point (either that it is or that it is not dangerous) would be quite superfluous; and the contest between sanitary rules and medical theories in such cases would cease, because medical theories would be "out of court." But, asks one, "Is it not true, that some of the diseases just enumerated as dangerous to public health are at times quite harmless?" Yes, beyond doubt. Then he asks, "Why include them in the statutory enumeration of dangerous diseases?" It is true, beyond question, that scarlet fever, measles, diphtheria, erysipelas, and even small-pox itself, occasionally come in forms so mild that nobody is hurt. But as a rule their ravages are to be dreaded. Suppose either of the diseases named appear in your city to-morrow,—will you assume at once and before the disease has shown whether it comes in dangerous form or not, that *it is safe* for your children to be exposed to it (especially as severe cases are frequently caused by exposure to a mild case)? Or will you assume danger until safety is demonstrated? Which will be the wise assumption? The law and common sense assume danger, and the law lodges discretion (where discretion is to be exercised) in a board of health. It may occasionally be safe to say when disease first comes, that it is not in dangerous form; but it is *safer* to say *after* the disease has passed away, that it has been mild and thank God that wives and little ones have been spared,—safer than (because of recklessness in the beginning) to mourn in the end over lonely hearth-stones and clustered, perhaps thickly-clustered, grave-stones. Who is the wise and prudent man—he who seeks to avoid or avert a possible danger, or he who recklessly or ignorantly rushes headlong upon it?

But perhaps another objector asks: "Are all these diseases which it is proposed shall be enumerated in the statute, are they all contagious? No, not at all times, and some of them perhaps not contagious at any time. "Are not people often exposed to them without taking them?" Yes; it does so happen, even with small-pox. "Then why make and enforce such rigid rules?" My friend, your neighbor's house may be on fire, and yours, because of rain or the direction of the wind, may escape—may not be scorched. But should his house, rebuilt, again take fire, will you, because of your first experience, assume that fire is not catching and that your house is safe? Your child may be exposed to scarlet fever, and for some occult reason not take the disease; does this make it safe to expose all your children again and again to the same danger? Rest assured that you cannot, from a single fact or a few facts, deduce a rule that will be a safe guide in the treatment of all similar facts. Children exposed to scarlet fever or diphtheria without taking the disease have often taken it and died after a second or third exposure. That they do not catch it, is not conclusive that it is not catching.

To conclude, let the legislature be slow to assume that these communicable diseases are not dangerous; casting all medical theories to the winds and basing its action on *facts*, let it determine to err, if it err at all, on the safe side, entrusting discretion in the management of those diseases only to boards of health and not to irresponsible and perhaps reckless individuals. Require reports of all cases to be made and make the requirement efficient by practicable penalties. When disease comes competent health officers can soon determine whether rigid repressive measures are necessary or not.

Dr. Pratt's paper was followed by a paper on Means of Promoting the Public Health, by Rev. J. Morgan Smith, of Grand Rapids. It is as follows:

MEANS OF PROMOTING THE PUBLIC HEALTH.

BY REV. J. MORGAN SMITH, OF GRAND RAPIDS.

It seems as if the public health would be rapidly promoted by the means now a-foot. State-wise and nationally we are organized for all sanitary purposes. Facts concerning the causes of mortality and disease are spread over our newspaper pages in profusion. Every science is at our disposal. Our physicians are a large standing army of sanitarians. There are more health laws than we can execute. The example of the civilized world urges the people to improvement.

I think we have all admitted the necessity of educating public sentiment, which means, I take it, the bringing of the majority to the spot where they will furnish the means to enforce properly authorized sanitary conclusions. Our publications are abundant. The circulation of sanitary tracts at a cheap rate can be promoted at a very slight cost. A good deal of wholesome truth is disseminated by our conventions.

All this sows gradually a sanitary opinion among those who are naturally interested in such a matter. It does not penetrate the masses who either know nothing about us, or regard us as amiable lunatics. Sanitary evangelization must come at last to each individual and house. The present canvass is not adequate, and bears as yet no signs of a popular cause. As I said last year, at the convention in Grand Rapids, we have only to compare the enthusiasm for temperance,—one remote branch of the sanitary cause,—with that for our work, and we shall realize that we are but in the incipient stages of our reform. We have a whole generation to educate in the rudiments of sanitation, and to know that scientific cleanliness is next to systematic godliness. I suggest that instead of flooding the elect with convictions of which they are desperately convinced already, we print a sanitary primer and have it taught by law in all our schools. I would make it very simple in this wise:

LESSON I.

What is sanitation?
The art of being clean.
What does cleanliness mean?
To keep our bodies and surroundings free from dirt and poison.
Why should we be free from dirt?
Because the wages of dirt are death.
What are the elements of cleanliness?
Bathing, pure air, sweet food, and drink, and agreeable smells.

"In Adam's dirt
We got much hurt."

To these primer lessons should be added illustrations of the concrete horrors of unsanitary states. Let the eye of the child be taught to shrink from the degenerate globule of blood, the villainous ferment of infection which spreads through this "muddy vesture of decay"! Let it gaze transfixed on the adulterous animalcule that corrupts our tissues! Let it trace with terror the sneaking death that hides behind our walls and in our cellars! "Words," said a shrewd man, "are the poorest vehicle of knowledge." We must see and handle the truth, before we are persuaded. Circulate then the microscope, the calcium light, and the diagram, till the blunted senses of an unsanitated generation are trained to recognize their secret foes, minute in size but monstrous in wickedness! In short if we are to educate a generation we must make thorough work of it. Bad habits are also educating man in an unwholesome direction. Filth and poverty wrap their rags around thousands in our cities. Their nature is subdued to what it works in. They become wonted to a short, mutilated, poisoned, decrepit life, and have little hope in any other. The power of nice distinction is obliterated. A healthy life they do not dream of. The touch of even cold water is dreaded. The same dullness is found even among more decent folks. When you think that a public bath-house is an almost unknown thing in our cities, and what horrible personal uncleanliness often walks under immaculate linen, you can imagine that no means are too excessive to change the tastes and manners of our time into a disposition which will push on our cause.

As to executive plans—in the second place, we meet the obstacle of *cost* which bars our road almost before we have traveled it at all.

Dirt as we know is "dirt cheap." Cleanliness in the higher degrees is expensive. A gentleman in New Jersey spent *thirty thousand dollars* in draining his new house. The thorough fitting out of a modern city house with pipes and plumbing, drainage and bath-rooms, would build a good house for a mechanic. The sewerage system of a moderate city runs into the millions of outlay. Every item in the bill of annual sanitation, by inspection, disinfection, clearing of premises, safer food and drink, is a new figure in the scale of household costs. To carry out sanitary laws thoroughly, would at last entail a new tax, equal to our school or police tax. Men hesitate to enter upon a new *system of expenses* under the uncertainty as to results which at present exists. In our city, we have, with facts sufficient at hand, failed to secure pay for even inspection of the active causes of disease.

Thorough sanitation involves—

1. *Sanitary education.*
2. *Sanitary inspection.*
3. *Sanitary construction.*

It is quite evident that all sanitary propositions from our sanitary authorities will be but slowly accepted, when it is apprehended how much their consistent application will demand over and above all the other improvements with which we are at present charged.

I do not doubt that judicious investments in a sanitary system will at length pay. If we put less useless architecture into churches, state-houses, city-halls, and fancy school-buildings, if we divert some of our means from the decorative fresco of extravagance with which we disguise bodily unwholesomeness, we should have the ability so to improve our physical habits, as to *furnish the joy of health,* without which the palace is but a home for gilded disease. We might escape doctors and drug-stores, and actually save money by securing bodies which are something else than boxes for quinine pills. The self-denials necessary to public sanitation would be in the end a gain.

But at present where are we? Unable I think to meet easily our first bills in putting our glorious cause on foot, devotedly canvassing the community for loving hearts to die—for nothing, in the name of sanitation. We are preachers and missionaries, sustained by the good will and hospitality of the people, because we have a name to do good by. Will these same people *institute* and *sustain* permanent sanitation? *They* must know as well as we how the money is to be had for so great an improvement.

1. I agree to the *worth of existing organization.* The State has proceeded in the right direction so far in its boards of health, State and local. Are we not ready to ask of the State further appropriation?

We are justified, I believe, in asking more public money, first, for a more thorough examination of *localities* reported as *dangerous.* The examinations of our society in Grand Rapids during the past year revealed that we were not able to judge with certainty concerning infectious and contagious diseases. It was rarely that we felt justified in advising the appropriation of money for special sanitary measures, in the removal of causes of diphtheria for example, because we were not sufficiently sure that the expenditure would be effective. The investigation of *fresh meats and vegetables on sale,* of prepared foods and medicines, of butter and milk, of suspicious graveyards and cemeteries, of spreading diseases among animals, of ventilation and house drainage, and of water supplied to towns and cities from water-systems, is difficult to bring to the point of obvious proof, still less to that of scientific proof. I was impressed with the imperfect logical condition of many sanitary conclusions. It seemed to me, on many subjects, that the most we could say was, "There is a rational probability here that we ought to examine this difficulty to the bottom." Such probing requires able minds, expert in their profession; it requires time, instruments and money. We ought to bore into this subject as men are boring into New Mexico and Idaho for silver ores. The State ought to make an appropriation of ten thousand dollars a year to satisfy the fairest and most prudent estimate of the conditions of this subject, and place it at the disposal of the State board to use when they deem it necessary. I say this as a prudent and economical citizen and not as a sanitarian.

2. Locally, in our towns, villages, railroad-centers, and cities, we need legal, *universal, careful,* and *constant inspection* of the ever-renewed violation of sanitary regulations. Such violation is found in the erection of dwelling-houses, in imperfect drainage, in exposure of fermenting substances to the air of the streets, in insufficient ventilation, in filthy alleys, in the careless private handling of infectious diseases without regard to the provisions of the law, in the existence of noxious slaughter-houses and factories within reach of susceptible nostrils, and in many ways known to all observers. It has been suggested to me that, under the present regulations affecting sudden and violent deaths, coroner's juries have become unnecessary. Could we not abolish them and appropriate their cost to sanitary *inspection?*

3. I would suggest, also, the use of police authority and moderate fines for clear cases of *neglect* or *resistance* to *sanitary authorities.* Rather than to create another system of special sanitary police, it seems to me better to work through the ordinary authorities to which the people are used to submit. They resent a school board police, the magisterial authority of a board of public works, and are fretted by the attempts of sanitary officers to enforce their special regulations. The administration of government needs to be simplified so as to work through as few channels as possible. This also would save expenses.

4. Just at the present time, a State lecturer of ability on the practical bearings of established sanitary conclusions, would do much good. A course of six popular lectures, on Water, Food and Drink, Drainage, Ventilation, Infectious Diseases, and Preventable Mortality, would, if able, interesting, and clear, and delivered in every town of 2,000 inhabitants and over, do much to

facilitate future action. I recommend that such a course be set on foot and paid for by the State, on the ground that *voluntary labor* is not systematic and general enough and keeps us too long in the stage we are now in of *experimental* discussion and preliminary organization.

Gentlemen of the convention, I have suggested as means towards forwarding sanitary improvement more rapidly—

1st, Sanitary education in the common schools.

2d, A State appropriation for thorough sanitary investigation.

3d, The appropriation of *coroner's money* to local sanitary inspection.

4th, The transfer of pains and penalties to the hands of the ordinary police.

5th, A system of popular instruction by lecturers in places of 2,000 inhabitants and over,—till the land is evangelized.

I add these suggestions to means and laws already existing for the furtherance of this great and necessary cause of humanity. They have grown from anxious observation of the state of this cause in Michigan, and in the city where I reside. We are getting on *too slowly*. We are too much regarded as specialists and hobby-horse riders. We must go to the people with the facts. If we do not act more vigorously, one generation of the impenitent and unsanitated will leave their carcasses prematurely in the wilderness of preventable causes of suffering and *death*.

REPORTS OF COMMITTEES.

The committee on resolutions reported a series of resolutions endorsing the work of the State Board of Health and urging the Legislature to grant an additional appropriation for its use.

The report of the committee on resolutions was adopted.

REPORT OF COMMITTEE ON SANITARY APPLIANCES.

To the Sanitary Convention:—

Your Committee on Sanitary Appliances respectfully report that it has examined all appliances exhibited, including:—

Scott's None-Such Ventilator and Chimney Cap.
Cudell's Sewer-gas and Back-water trap.
Clement's dry Safe-waste trap.
A Sanitary Detective.

The committee believe these are useful appliances.

Le Roy Parker,
Henry B. Baker,
J. G. Millspaugh.
Committee.

Mr. Jno. K. Allen, of Lansing, proposed a vote of thanks to President Barnes and Secretary Kellogg for their valuable services as officers of the convention. The same was heartily adopted, as was one thanking the local committee. President D. F. Barnes said that he thought that the thanks of our citizens were more due to the gentlemen who had so kindly come to this city and enlightened our people on the needs and way of sanitation, and who by their interesting papers and addresses had helped to educate and advance our people in this direction. He hoped the matter would be taken up in a local way.

Rev. J. Morgan Smith then pronounced the benediction, and the convention closed.

J. H. Kellogg, M. D.,
Secretary.

ANNUAL ADDRESS OF THE PRESIDENT.*

BY PROF. R. C. KEDZIE.

Dr. Henry B. Baker, Secretary of State Board of Health:

DEAR DOCTOR:—Permit me through you to announce to the State Board of Health the fact of my declining a reappointment as member of that Board. My declinature was not from loss of interest in the work of the Board, or from want of harmony in the Board, because my relations with the Board and all its members have been most pleasant and harmonious. But I have found that the work coming upon me as member of the Board made serious demands upon my time; and as my time is not my own, I determined to lay my appointment before the State Board of Agriculture, who have the right to dispose of my time, and ask their advice about accepting or rejecting the reappointment, with the understanding that their decision would guide my action in the case. I did this at the late meeting of that Board, and almost unanimously they advised me to decline. I have followed their wishes, and declined the position.

In sundering my relations with your Board I naturally bring in review the history of the Board since its organization eight years ago. I remember the mingled feelings of hope and fear with which we entered upon our work. I recall the words of Gov. Bagley when he commissioned the members: "You have got your law, and I have commissioned you as members, but whether your Board will continue *will depend upon the amount and kind of work you do as members of the Board.*" The members did work, earnestly and conscientiously, and the Board has made a place for itself among the powers of the State. I note how your Report has grown from a thin pamphlet to a volume of respectable dimensions. I see with pride that every city, village, and township in our State has a board of health and a health officer. I note with satisfaction that the holocausts of kerosene accidents and naphtha explosions so common eight years ago, have forever been extinguished by the strong hand of law. I see everywhere in the State the effort to fence in and stamp out infectious and contagious diseases. The ventilation of school-houses, churches, and dwellings now receives a degree of attention unknown before. The waters in our wells and cisterns, the drainage of swamps, the sewerage of our houses, have all been brought into prominence by the labors of our Board. In all this work we have been greatly assisted by the public press; but the press itself has been stimulated by the work of this Board. Compare our newspapers in the discussion of sanitary matters with the newspapers of eight years ago. In short there has been a general advance along the whole line of State medicine, but we have kept such even step in this advance that we only become aware of our change of position by comparison with the landmarks of eight years ago. Last but not least among the agencies set in operation for promoting the public health I note the sanitary conventions for the discussion with the people of all matters relating to their physical well-being. I believe these sanitary conventions are fraught with good—unspeakable good—to the people of our State. The forces which are thus set in motion are not temporary in their influence but will flow on in a stream of blessing to the end of time. Looking down the vista of coming years, through the combined action of these various agencies, I seem to see human life raised into a higher plane, where health and joy shall be at their maximum, and disease and pain shall be at their minimum. God speed that day, and God bless all agencies which shall usher in its glorious dawn!

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* This letter from Prof. R. C. Kedzie, President of the State Board of Health, was read at the Annual meeting of the Board on April 12, 1881. The communication was ordered published in the Annual Report, as the annual address of the President.—H. B. B., Sec. S. B. of H.

The State Board of Health seems now to have reached a point at which it must take a new departure if it would fill the measure of usefulness to which it has grown. The information gathered by the Board needs to be scattered broadcast among the people; new and original investigations into the nature and into the means of arresting contagious diseases, need to be undertaken and pushed forward by the Board. The information gathered up by the Board will be of small benefit if imparted to only a few. The State cannot afford to hide the light under a bushel by any such penurious policy. Take the case of diphtheria, about which physicians are divided in opinion—some regarding it as a filth disease caused by unsanitary surroundings and entirely non-infectious, while others regard it as the result of a specific poison and eminently infectious—some even regarding it as an offshoot of the Oriental plague. How important that we have definite knowledge upon such subject, and how proper that a question so intimately connected with the public health should be investigated by the State Board of Health!

But such new departures demand the expenditure of more money. A bill for meeting this demand is now before the Legislature, and I am sorry to learn that its passage is opposed, mainly because its objects are misconstrued.

The State expends in a time of profound peace tens of thousands of dollars annually in military affairs, the equipment, encampment, and drill of our State troops, and this is in accordance with the wise maxim, "In peace prepare for war." But if in peace we expend thousands for war which may never come, shall we refuse to expend units for defense in the presence of the ceaseless warfare of disease? "There is no discharge in this war"—no white flag of truce except a shroud—the firing all along the skirmish line is constant, and in epidemics we have pitched battles in which the dead and wounded are counted by thousands. We mourn the ravages of war, but in active service disease strikes down more, by ten to one, than musket-shot and sabre-stroke. The heart of Michigan goes out tenderly to the thousands who "died that the country might live." But since the war, scarlet fever and diphtheria have slain more in Michigan than the countless throng who went forth from our borders only to go down in the wild whirlwind of battle. Shall these destroyers of prattling infancy continue to fill our State with weeping Rachels, and will the Legislature refuse a pittance to learn some means of breaking their power?

In bidding farewell to the State Board of Health, I leave you with the kindliest feelings towards all its members, and with an earnest wish for your highest prosperity and usefulness. I shall watch your future course with keen interest and lively sympathy. "Peace be within thy walls, and prosperity within thy palaces.'

Yours faithfully,

R. C. KEDZIE.

LANSING, APRIL 9, 1881.

HEALTH LEGISLATION IN MICHIGAN.

SUBSTANCE OF THE TITLES OF PUBLIC ACTS OF THE LEGISLATURE OF MICHIGAN IN 1881, RELATING TO SUBJECTS MORE OR LESS CLOSELY CONNECTED WITH PUBLIC HEALTH AND SAFETY.

REPORT BY HON. LEROY PARKER, OF FLINT, COMMITTEE OF THE BOARD ON LEGISLATION IN THE INTERESTS OF PUBLIC HEALTH.

Although past work of the State Board of Health has evidently influenced some of this legislation, it is proper to say that with respect to most of these laws neither the committee of this Board on legislation in the interests of public health nor the office of the Board was consulted by the committees of the Legislature having the several bills in charge.

The following named 46 acts seem worthy of mention. The numbers beginning paragraphs are the numbers of the acts in the published volume of Public Acts, Laws of Michigan, 1881:

No. 5. An act to authorize the board of control of State swamp lands to make an appropriation of swamp lands to drain and reclaim certain swamp and overflowed lands in Porter township, Cass county.

No. 14. An act to authorize and empower the board of control of State swamp lands, to make an appropriation of State swamp lands, to drain and reclaim certain swamp and overflowed lands in the townships of Owosso and Middlebury, in Shiawassee county.

No. 15. An act to repeal compiler's sections 1360 to 1448 inclusive, of the compiled laws of 1871, * * *, the same being a part of chapter 33 of the compiled laws of 1871, entitled "The inspection of provisions and other merchandise, and regulations respecting the sale thereof."

No. 16. An act to amend sections 1 and 2 of act No. 138 of session laws of 1875, relative to subjects for dissection for the advancement of science, * * * the same being sections 2110 and 2111 of the compiled laws of 1871, as amended.

No. 34. An act for the protection of dairymen, and to prevent deception in the sales of butter.

No. 41. An act to amend sections 3 and 4 of act No. 226 of the session laws of 1879, entitled "An act to provide for the safety of persons attending public assemblies," * * *, and to add three new sections thereto to stand as sections 5, 6, and 7.

No. 49. An act to amend sections 3 and 4 of act No. 127 of the session laws of 1879, entitled "An act to to provide for the inspection of illuminating oils manufactured from petroleum or coal oils, and to repeal act No. 181 of the session laws of 1875, * * *, and act No. 196 of the session laws of 1877, * * *."

No. 50. An act to authorize the board of control of State swamp land to make an appropriation of swamp land to remove bars and obstructions in Maple River, in the counties of Clinton and Gratiot.

No. 56. An act to amend act 167 of the session laws of 1871, entitled "An act to provide for the better protection of human life on railroad trains," being sections 2397 and 2398 of the compiled laws of 1871.

No. 63. An act to authorize the board of control of State swamp lands to make an appropriation of swamp lands to drain and reclaim marsh and overflowed lands, in the township of Clarence, Calhoun county.

No. 64. An act to provide for the drainage and reclamation of State swamp lands by means of a State road to be known as the Monistique River State Road.

No. 66. An act to authorize and empower the board of control of State swamp lands to make an appropriation of State swamp lands, to drain certain swamp and overflowed lands in the township of Wilber, Iosco county.

No. 75. An act to authorize and empower the board of control of State swamp lands to make an appropriation of State swamp lands, for the drainage and reclamation of certain lands, by the construction of a State road from Little Traverse in Emmet county, to Mackinaw City in Emmet and Cheboygan counties.

No. 76. An act to authorize and empower the board of control of State swamp lands to make an appropriation of State swamp lands for the purpose of draining and reclaiming, and otherwise benefiting certain lands along Bear Creek, in Emmet and Charlevoix counties, by constructing a State road from Petoskey to the Spring Vale and Boyne City State Road, in Charlevoix county.

No. 79. An act to amend section 1 of act No. 137 of the session laws of 1879, entitled "An act to authorize and empower the board of control of State swamp lands to aid in the improvement of Black river, in Cheboygan county."

No. 84. An act to amend an act entitled "An act to prevent the sale or delivery of intoxicating liquors, wine, and beer to minors, and to drunken persons, and to habitual drunkards; to provide a remedy against persons selling liquor to husbands or children in certain cases," approved May 3, 1875, as amended by act No. 193 of the session laws of 1877, and act No. 267 of the session laws of 1879, by adding a new section thereto, to stand as section 7, in relation to costs.

No. 85. An act to authorize the board of control of State swamp lands to make an appropriation of swamp lands to drain and reclaim certain swamp and overflowed lands in Ingham and Bunkerhill townships, Ingham county, by opening and deepening the natural outlet of Hewes and Ewers lakes.

No. 88. An act to authorize and empower the board of control of State swamp lands to make an appropriation of State swamp lands to drain and reclaim certain swamp and overflowed lands in the townships of Conway, Handy, and Iosco, in the county of Livingston.

No. 94. An act to authorize the board of control of State swamp lands to make an appropriation of swamp land to drain and reclaim certain swamp and overflowed lands in China and Cottrellville and Clay townships, St. Clair county.

No. 110. An act to authorize and empower the board of control of State swamp lands to make an appropriation of State swamp lands for the construction of a ditch in the county of Alpena.

No. 121. An act to authorize and empower the board of control of State swamp lands to make an appropriation of State swamp lands to drain and reclaim certain swamp and overflowed lands in the township of Berlin, St. Clair county, and the townships of Almont and Imlay, in the county of Lapeer.

No. 130. An act to authorize the board of control of State swamp lands to make an appropriation of swamp land to drain certain marsh and overflowed lands in the townships of Florence, White Pigeon, and Sherman, in St. Joseph county.

No. 132. An act to authorize and empower the board of control of State swamp lands to make an appropriation of swamp lands to drain certain overflowed lands in Jackson county. [Deepen and straighten Grand river in the townships of Blackman and Rives, also deepen the channel of Portage river in the townships of Blackman, Leoni, and Henrietta, Jackson county.]

No. 134. An act to appropriate State swamp lands to aid in dredging and otherwise improving the Ontonagon river and harbor, and for the purpose of reclamation and drainage.

No. 135. An act to authorize the board of control of State swamp lands to make an appropriation of swamp lands to clear out, widen, and deepen the channel of Prairie river for the purpose of reclaiming certain swamp and overflowed lands in St. Joseph county.

No. 136. An act to enlarge the powers of boards of health of townships and villages in certain cases.

No. 139. An act in reference to the holding of inquests on the view of dead bodies by county coroners.

No. 141. An act to prevent the spread of foul brood among bees, and to extirpate the same.

No. 152. An act to authorize the board of control of State swamp lands to make an appropriation of State swamp lands to drain and reclaim certain swamp and overflowed lands in the township of Pavilion, in Kalamazoo county.

No. 156. An act to amend sections 1, 4, 6, and 8 of act No. 268 of the session laws of 1879, entitled "An act to provide for the taxation of the business of manufacturing and selling spirituous and intoxicating, malt, brewed, or fermented liquors," approved May 31, 1879.

No. 174. An act to prevent the spread of the yellows, a contagious disease among peach, almond, apricot, and nectarine trees, and to provide measures for the eradication of the same, and to repeal act 32 of the session laws of 1879.

No. 183. An act to compel steam vessels navigating the waters of the State, to provide fire screens for smoke-stacks, and to provide a penalty for its violation.

No. 190. An act to provide for the safety of brakemen and other employees on railroads.

No. 191. An act to prohibit railroad companies from carrying on passenger trains any kerosene, benzine, naphtha, gasoline, or any inflammable oil, or fluid, other than as may be necessary to light or lubricate the cars composing the train on which such oil is carried.

No. 202. An act to amend section 2 of act No. 56 of the session laws of 1877, * * *, entitled "An act to amend sections 1692 and 1693, chapter 46, of the compiled laws of 1871, relative to boards of health and health officers in townships."

No. 203. An act to authorize the board of control of State swamp lands to make an appropriation of swamp lands to drain and reclaim certain swamp and overflowed lands in Huron county.

No. 222. An act to amend section 1 of an act, entitled "An act to authorize the board of control of State swamp lands to make an appropriation of State swamp lands to aid in the construction of a ditch in Bay county," approved May 27, 1879.

No. 239. An act to authorize the board of control of State swamp lands to make an appropriation of State swamp land, to aid in the removal of bars and other obstructions to the free flow of water in the Lookingglass river, in the counties of Clinton and Shiawassee.

No. 241. An act making an appropriation to enable the State board of health better to collect and disseminate information useful for the promotion of the public-health.

No. 244. An act to authorize the incorporation of companies for the construction of union railroad stations and depots, with the necessary connecting tracks, and the management of the same.—Section 34, Liability of company for causing death.

No. 254. An act to prevent and punish the adulteration of articles of food, drink, and medicine and the sale thereof when adulterated.

No. 259. An act to regulate the sale of spirituous, malt, brewed, fermented, and vinous liquors, to prohibit the sale of such liquors to minors, to intoxicated persons, and to persons in the habit of getting intoxicated, to provide a remedy against persons selling liquor to husbands or children in certain cases and to repeal all acts or parts of acts inconsistent herewith.

No. 260. An act to provide for the protection of children.

No. 269. An act to revise and consolidate the laws of this State providing for the drainage of swamps, marshes, and other low lands, and to repeal the acts of March 22, 1869, and April 13, 1871, known as the county drain law and the township drain law.

No. 290. An act to amend sections 1 and 2 of act No. 160 of the session laws of 1877, being an act to authorize the board of control of State swamp lands to cause the removal of a jam or raft of floodwood from the Shiawassee river in the township of St. Charles, in the county of Saginaw, and to appropriate not exceeding 10 sections of State swamp land to defray the cost thereof.

Local act No. 399 provides a board of health for the city of Detroit. (See page 61 of this Report.)

The bill, prepared by this committee by request of the Board, designed to provide for a system of inspection of steam boilers, was presented to the legislature, but was defeated. Experience has shown that a law such as would result from the passage of such a bill would tend to prevent many deaths now caused by the bursting of old boilers, which by a competent inspector would be condemned.

SYPHILIS (THE GREAT POX).

BY HENRY F. LYSTER, A. M., M. D., OF DETROIT, MICH., MEMBER OF THE STATE BOARD OF HEALTH, AND ITS COMMITTEE ON EPIDEMIC, ENDEMIC, AND CONTAGIOUS DISEASES.

This disease exists in all parts of the world, among all nations, and has a greater influence upon the public health than is generally attributed to it. This fact is due to the multiform conditions and circumstances under which syphilis appears, as well as to the frequency with which it is the primary cause of, or complicates other and apparently totally different forms of disease, like scrofula, consumption, etc. The fact that it is usually contracted by impure sexual intercourse, under circumstances which are in violation of the laws with which society has endeavored to guard itself, has led to a general avoidance of popular discussion of this disease and its consequences, so that but little is definitely known by the people as to its deplorable results.

If the consequences of the flagrant violation of the moral law were visited alone upon the heads of those who break it, public-health bodies might easily decline to notice it, but unfortunately this is not so. Far from being simply an acute or chronic affection, limited to those who contract it, it may descend as a heritage unto the third or fourth generation, an undesirable heirloom, the author of scrofula and consumption, and enfeebled constitutions in those who knew no evil.

The history of this plague comes down to us from the earliest ages, and is most graphically described by ancient writers both of sacred and profane history. A prominent medical authority (Dr. Aitken of London) defines syphilis as "the result of a specific poison produced solely by contagion or implantation on some part of the body, generally through abrasion or sore consequent on sexual intercourse with an infected person. Three weeks or a month after absorption of the poison, a peculiar series of phenomena supervenes which mark the general infecting of the system. The principal anatomical signs of general infection consist of induration (specific) around the spot where the virus has been implanted, induration of the lymphatic system of glands, the formation of nodes or gummatous nodular tumors in the connective tissue generally, and especially in that of the true skin, bones, and mucous membranes and solid viscera, *e. g.*, liver, brains, lungs, heart. A cachetic condition of the system follows, and accompanies the phenomena of infection, and induration may remain in the form of hardened fibrous tissue in various parts of the body for an indefinite period of time," The geographical distribution of this disease is extensive, and seems to be limited by no latitude or longitude. One or two comparatively isolated regions were formerly believed to be free from it, but this belief needs confirmation. It is said to be more malignant in warm countries than in temperate climates, and it certainly is more prevalent among the Latin than among the northern races. Its malignancy in the tropics may sometimes be due to the want of acclimatization of the victims and the low condition of the system for want of proper food; especially is this the case with sailors and soldiers; the stale diet of long voyages, and lack of fresh vegetables and meats, all favor scurvy, which complaint greatly aggravates the syphilitic lesions. The prevalence of syphilis is determined more by the facilities for commercial trade and travel than from a generally depraved morality.

In a large tract of country where the population are engaged in agriculture, and where the dwellings are scattered, there will be found a minimum of venereal disease, and where it is introduced in such a community it soon dies out again by the natural limitation. In confirmation of this statement, I cite the returns of the Provost Marshal General of the U. S. Army for 1863 and 1865. For over half a million of drafted men between the ages of 20 and 45, the rejection among farmers on account of constitutional syphilis was 2.059 per thousand:

	Rejected per Thousand.
1. Barkeepers	29.882
2. Sailors	29.721
3. Boatmen	28.486
4. Servants	27.701
5. Watchmen	25.547
6. Ostlers	15,134
7. Carters and drivers	13.762
8. Firemen	13.619
9. Porters	13.274
10. Soldiers	12.831
11. Laborers	12.276
12. Railroad men	11.882
13. Fishermen	9.881
14. Other occupations	7.421
15. Factory hands	5.384
16. Miners	4.610
17. Lumbermen	3.390
18. Farmers	2.059

The above have been classified as unskilled labor. Taking the professions, mercantile and skilled workmen, and unskilled laborers, the following table would show the number per thousand rejected on account of syphilis for military service between 20 and 45 years of age from among volunteers, conscripts, and drafted men between 1863 and 1865, in 334,321 persons whose examinations have been recorded:

All occupations	334,321,	rejected	per	thousand	8.177
1. Skilled workmen	75,761,	"	"	"	10.639
2. Mercantile	18,818,	"	"	"	9.725
3. Unskilled	232,166,	"	"	"	7.253
4. Professions	7,576,	"	"	"	7.115

These cases did not include those suffering from the primary sore, or infection of syphilis, but only those who were afflicted constitutionally so that they were unfit for military service. While then these proportions may be true regarding the most exposed age and largely among unmarried persons, they will not correctly estimate the syphilitic among the population. A large number of persons who have had syphilis have been cured, or at least relieved of the more active symptoms, and present no lesions by which the examiners could reject, and yet these persons might become the parents of syphilitic children, and entail upon their progeny an enfeebled and scrofulous constitution. The conscript if passed into military service, although presenting no active lesions, might upon exposure, suffer from rheumatism and iritis, and become a drag and dead-weight upon the army. In a report by Dr. Frederic B. Sturgis, of New York, 1873, the statement is made regarding those treated at the hospitals and dispensaries in New York city, that of 280,536 poor persons receiving aid at public institutions, 12,341 suffered from venereal disease, 5,045 of these being syphilitics, *i. e.*, 18 in every 1,000 persons were syphilitic.

Dr. A. L. Gihon, U. S. navy, reports to the American Public Health Association, New Orleans, 1880, that 53 per 1,000 of sick in the U. S. navy during six years, from 1875 to 1880, were from syphilis, and that 34 per 1,000 sick in U. S. army from 1875 to 1880, were from the same cause,—1875 to 1880, mercantile marine, U. S. (U. S. Marine Hospital Service, official report), total sick, 13,906; syphilis, 2,374, *i. e.*, 18 in every 1,000 were syphilitic.

Mr. Wagstaff, quoted by Dr. Gihon, report for London, 1868, gives 35 per 1,000 of all cases of sickness treated in the London hospitals and dispensaries, were syphilic, and that 69 per 1,000 were venereal.

These estimates for New York or London do not include those treating themselves, or who are treated at physician's offices or by druggists and other irregular practitioners.

During the same year, 1868 (Dr. Gihon's report), 9,796 venereal patients were treated at the hospitals in Paris, and M. Tecour, prefect of police, estimating them as one-fifth of the total number of venereal patients treated at their houses by physicians, and who seek relief at the hands of apothecaries and charlatans, gives a sum-total of 48,980 cases, about one in forty of the entire population.

The same estimate of the proportion of private to public cases of five to one, arrived at by Dr. Sturgis from wholly different data, would give for New York, out of a much smaller population, 61,705 venereal patients in that year, 1873. Nearly one in fifteen of its men, women and children—a number only dwarfed by comparison with London where 100,000 poor alone are annually affected with syphilis.

Still quoting from the report of Dr. Gihon, with reference to the distribution of this disease: He quotes Parent Duchatelet, a French physician, as saying, "Of all contagious diseases to which the human species is liable, and which causes the greatest evils to society, there are none more serious, more dangerous or so much to be dreaded as syphilis—its ravages far surpassing those of all the plagues which at different times have terrified society."

Dr. Gross and Dr. Marion Sims: "A greater scourge than yellow fever and cholera and small-pox combined is quietly installed in our midst, sapping the foundations of society, poisoning the sources of life, rendering existence miserable and deteriorating the whole human family."

Sir Thomas Watson: "It counts its victims not only in the ranks of the vicious and self-indulgent, but among virtuous women and innocent children by hundreds and thousands."

Sir James Paget: "It would be difficult to overstate the amount of damage that syphilis does to the population, children being born with diseases induced by it which render them quite unfit for the work of life."

This disease has existed from the earliest times: "Venereal sores commonly known as chancres and gonorrhœa were described in Chinese systems of medicine 4,500 years ago, also in the Hindoo, Arabic, Greek and Latin literature."—(Berkeley Hill.)

The first noted epidemic of syphilis occurred in Italy at the close of the fifteenth century, about the time of the discovery of the western hemisphere by Columbus, and this led to a belief on the part of many writers that it was imported by the earlier voyagers from the new world, an undoubted error, as the name "morbus gallicus" was already attached, indicating the French origin of certain cases. There can be no reasonable doubt but that this disease was brought to the western world by sailors and soldiers from the Mediterranean. The scattered dwellings and the several tribes, prevented by climatological preferences and by the hostile attitude of neighbors from communications, and but little barter or trade being required, render it doubtful that the disease was indigenous in this country.

C. Bäumler, a German physician and professor at Freiburg, writes in Ziemssen's Cyclopedia of Medicine, 1875, "All things considered, the probability is that syphilis existed in certain portions of Europe, more especially in Southern Europe, prior to the epidemic outbreak of the disease in Italy at the end of the fifteenth century."

At this time circumstances such as wars, pilgrimages, and movements of the people, as well as hardships from floods and famines, favored its epidemic spread, and that in a very pernicious form all classes were exposed to its ravages and no rank, however exalted in church or State escaped.

Bäumler also remarks, "It is in the highest degree probable though difficult to absolutely prove that not only local affections of the most varied description, due to unclean sexual connection, but also syphilis existed even in antiquity, both in the East and in Europe, but it was not recognized as a disease *sui generis* until the close of the fifteenth century."

The disastrous effects of syphilis are shown in the individual by a weakening of the constitution and diminution of the red blood corpuscles; by ulcers on the tongue and cheeks and tonsils; by attacks of inflammation of the iris (or iritis); in some cases by a loss of the nasal bones by ulceration and necrosis, in some by the loss of the soft palate by ulceration; by pains in the head and in the shin bones, and enlargements upon the bones of the head and legs; by changes in the brain producing paralysis and insanity or mental idiocy; by syphilitic tumors in the liver and heart and lungs, and other internal organs; by rheumatism and general debility; by chronic skin diseases of an ulcerative and scaly or crusty appearance; in scrofulous persons by complicating pulmonary disease and increasing the ulceration of the larynx; determining ozena or chronic catarrh of the nose and frontal sinuses. The syphilitic may be reduced to the most pitiable and obnoxious condition possible, and finally death may close the sad chapter of a life of suffering.—(Psalm.)

Syphilis may be contracted by innocent and unsuspecting parties, conveyed by a lover's kiss, or by a cup, or glass, or towel, or pipe, or poisoned penknife, or penholder, or pencil, and in many other ways, when a delicate mucous membrane or a slight abrasion of the skin permits of the entrance of the most minute particle of the syphilitic poison. Syphilitics are poisonous in many ways while the virus is active in the system. All the syphilitic ulcers and discharges are poisonous wherever they may be,—the original sore or chancre, the mucous patch, or sore tongue or lip, the ulcer on the body, the nasal discharge, the saliva,—while the poison of the so-called secondary sores are not so readily received because more dilute and the poison less active, yet they are all poisonous and may readily give syphilis.

Syphilis is hereditary. The syphilitic infant is often readily recognized from its illy developed frame and from its old look, its coryza, its constant crying night and day, the suspicion of hydrocephalous, often in the shape of its head, its pale, sallow complexion, its spotted eruption on hands and feet, its ulcers in the septum of the nose, its want of development. The intensity of the attack will depend upon, it may be the quality of the virus to which the party is exposed, but certainly is largely due to the constitution of the exposed party. In persons of naturally feeble and delicate constitution, particularly to those inclined to scrofula and phthisis, this disease is most disastrous. It is in those that the destruction of the bones and syphilitic degenerations occur known as tertiary syphilis. With the induration and glandular swellings the constitutional infection is observed in the general appearance of the individual. Pallor is noticeable, with decrease in weight, headaches become persistent in some cases, an eruption breaks out on the skin and in the mouth, copper-colored on the skin, round and bright, well defined, frequently the chest and forehead, forming the "corona veneris." These spots are usually the size of the end of a lead pencil or one-sixth to one-quarter inch in diameter. The tongue presents mucous patches or ulcers which are easily seen. These symptoms last for some weeks, and appear two to four months after the infection. The hair comes out freely at this time and is rendered scant and thin. This usually is restored upon the improvement or cure of the disease. The sore throat is a prominent symptom of secondary or constitutional syphilis. In the tertiary stage, which only appears in a limited number of cases, the bones are affected and caries and destruction of the nasal and palate bones is apt to occur, producing permanent deformity, and often affecting the speech, rendering it inarticulate.

All European governments have endeavored by legal enactments to restrain the spread of venereal diseases, and usually with very gratifying results. Beside the laws requiring the registration and inspection of prostitutes, in some countries persons can be proceeded against in the courts for conveying disease of this nature. All attempts to suppress prostitution of women have been failures from the earliest times, though tried again and again, and while it exists in different degrees it may be said to be almost universal in its extent with civilization. It is from this source that syphilis is continually drawn to work its disastrous influence upon the race. In this country attempts have been made to limit prostitution by regulating it, notably, at St. Louis, Nashville, and New Orleans, with some degree of success. Nothing has been done in Michigan. There can be no doubt but that the State has the power to regulate this evil as much as it has to regulate the sale of intoxicating liquors. Regulating prostitution of women does not compromise the State in the matter of morality any more than licensing the sale of liquors implies an endorsement of their use. Governments have in both instances shown an inability to suppress, and now in most countries they have at least striven to regulate and limit by official inspection. The good results in the British army quartered in England have been shown by the effect of the Contagious-Diseases Act, limiting in two years venereal disease more than one-half. In China and Japan the most gratifying results are experienced by the registration and government inspection of prostitutes. The returns of diseases in the East show among the mercantile marine and the navy of Great Britain a marked decrease of syphilis. All experience has demonstrated wherever it has been tried that the regulation of prostitution has been followed by a decrease of venereal disease among the people, and the abandonment has soon been followed by an increase.

The church has not been able to limit this scourge, neither has the general inculcation of morality by the press and the courts and schools. The general enlightenment and education of the people does not seem to limit it, in fact a larger per cent is found among the skilled workmen and the professions than among the unskilled laborers. The laws which govern its spread are not influenced by enlightenment of the people so much as by their movement and irresponsibility to society. While people differ greatly in their degree of enlightenment, the extremes are not so far apart in their want of knowledge regarding contagious diseases, and particularly regarding syphilis. The people should be instructed on this subject so that they may be guarded against the disease.

The young man is usually the person who, influenced by intoxicating liquors, indulges his sexual appetite with prostitutes, and stamps his constitution with a distemper which renders him as dangerous as a leper to those about him, and he transfers it to his newly married wife, and begets, particularly if the wife becomes infected, diseased children, or governed by a wise natural law may fail to have living children.

The innocent woman who has looked to the married state as the *ultima thule* of terrestial happiness, and has ideas of domestic life with the home and children, is doomed to the bitterest disappointment, loses confidence and love for her husband, and acquires a shattered constitution. She has awakened from her dream of life and has acquired a knowledge and experience which the State might have prevented if it had exercised its authority.

Besides the registration and official inspection of prostitutes and restraint of those found diseased, specific legislation has been suggested by many writers and observers, with reference to civil suits for damages and criminal prosecutions by persons infected, so that the terrors of the law might prevent those recovering and themselves diseased from infecting healthy persons.

The only way to limit the spread of venereal diseases, and the consequent exposure of thousands of innocent people, is by enlightening the community upon the nature, history, and consequences of these diseases, and particularly of syphilis, and by official registration and examination of prostitutes, and detention of those found to be diseased, and by the enactment of laws by which civil and criminal prosecutions may be instituted by persons infected by venereal disease in any of its forms.

REPORT OF THE COMMITTEE ON EPIDEMIC, ENDEMIC, AND CONTAGIOUS DISEASES.

BY HENRY F. LYSTER, A. M., M. D., OF DETROIT.

The following translations* are submitted by the committee, believing that the knowledge they contain is a great addition to that heretofore possessed on the modes of communicating certain diseases, and on their prevention :—

ON THE ATTENUATION OF VIRUS AND ON ITS RETURN TO VIRULENCE, BY L. PASTEUR, AIDED BY MESSRS. CHAMBERLAND AND ROUX.

In recent publications I have made known the first case of the attenuation of virus by purely experimental methods. This virus which is formed of an extremely small microbe, may be multiplied by artificial cultivation outside of the bodies. of animals. These cultivations left to themselves without possible contamination of the contents, experience in time more or less profound modifications in their virulence. The oxygen of the air suggests itself as the principal agent in these attenuations—that is, in these diminutions in the facility of multiplication of the microbes, for it is plain that the virulence in its various activities confounds itself with the various facilities of development of the parasite in the economy. It is unnecessary to insist on the interest of these results and of the deductions from them. To seek to diminish virulence by rational means is to base on experiment the hope of preparing from active virus, which is easily cultivated in the bodies of men or animals, a vaccine virus of restricted development, which shall be able to prevent the mortal effects of the active virus. The virus of charbon,† which is one of those best studied, should first demand our attention. But we at once meet a difficulty. There is an essential difference between the microbe of chicken-cholera and of charbon, which does not permit the new investigation to follow too closely the old one. The microbe of chicken cholera does not seem when cultivated to resolve itself into true germs. These are only cells or portions ever ready to multiply by scission, while the special conditions for producing true germs are unknown. The ferment in beer is a striking case of cellular productions which multiply indefinitely without the appearance of original spores. There are many mucedines with tubular myceliums which give in certain conditions of cultivation chains of more or less spherical cells called conidia. These when detached from their branches may reproduce themselves in the form of cells without ever producing (unless a change in the conditions of cultivation occurs) the spores of their respective mucedines. These vegetable organizations may be compared to plants that are multiplied by cuttings, and for which fruits or seeds are not used to reproduce the mother plant.

In artificial cultivations the bacteria of charbon behaves very differently. Its mycelian filaments, if they may be so called, have severally multiplied for 24 or 48 hours, when they, especially those having free contact with the air, transform themselves into highly refracting ovoid corpuscles, which slowly separate and become true germs of this little organism. New observation proves that these germs, which are formed so readily by cultivation, experience no change in either their vitality or virulence from the action of the air as time goes on.

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* [Apparently of papers presented before the Academy of Medicine, at Paris, France.—H. B. B., Sec. S. B. of H.]

† [Charbon (pronounced as if spelled sharbon) is another name for anthrax, malignant vesicle, or contagious carbuncle.]

I could show the academy a tube holding spores of a charbon bacteria formed four years ago (21st March, 1877); each year the germination of these little corpuscles has been attempted, and each year the germination occurs with the same facility and the same rapidity as at first; each year the virulence of the new cultivations is tested and it shows no apparent weakening. Hereafter why try the effect of air on the charbon virus in the hope of attenuating it? The knot of the difficulty is perhaps entirely in the fact of the rapid production of bacterian germs, which has been mentioned. In its filamentous form, and in its multiplication by scission, is not this organism entirely comparable with the microbe of chicken cholera? That a true germ, that a seed undergoes no modification by the air, is easily conceived, but it is as easily seen that if a change occurs, it should occur in a mycelian fragment. Thus a cutting abandoned on the ground to the contact of air would soon lose its vitality, while under the same conditions the seed (grain) would be preserved ready to reproduce the plant.

If these views have any foundation, we should be led to think that to test the action of the oxygen of the air on the bacteria of charbon it would be indispensable to be able to submit the mycelian development of the little organism to this action under circumstances in which it cannot furnish the direct germ corpuscle. Hence the problem which consists in subjecting the bacteria to the action of oxygen, becomes, to hinder entirely the formation of spores. The question being thus put, we shall see that it can be answered.

In fact, by various artifices we can prevent the appearance of spores in the cultivation of bacterian parasites. At the lowest temperature at which the parasite can be cultivated, that is, about +16° C., the bacteria forms no germs, at least for a very long time. The forms of the little microbe at this inferior limit of its development, are irregular, like balls, or in pairs, in other words, monstrous but without spores. The same is true at the highest temperatures at which the parasite can be cultivated, their temperatures varying a little with the media. In neutral chicken bouillon, the bacteria can no longer be cultivated at 45° C. On the contrary its culture is facile and abundant at 42° and 43° C., but also without formation of spores. Hence there can be maintained a mycelian cultivation of bacteria in contact with pure air at 42° or 43° C., entirely deprived of germs.

There then occurs the following very remarkable results: after waiting a month the cultivation is dead, that is when sown in fresh bouillon there is complete sterility. On all preceding days of the month, on the contrary, cultivation is facile. So much for the life and nutrition of the organism. As to its virulence, the extraordinary fact is established that it has none on the eighth day after exposure to 43° C., nor on any subsequent day; at least its cultivations are innocuous for the cobaya [Guinea pig], the rabbit, and the sheep, three animals most apt to contract charbon. We can then not only attenuate the virulence but apparently completely suppress it, by a simple artifice of cultivation. Moreover we have the possibility of preserving and cultivating the terrible microbe in this inoffensive state. What occurs sufficient to deprive the microbe of all virulence in these first eight days at 43° C.? Let us remember that the microbe of chicken cholera also perishes in cultivations in contact with the air,—after a much longer time it is true, but experiencing successive attenuations in the interval. Are we not authorized to think that the same must be true of the charbon? This prevision is confirmed by experience. Before the extinction of its virulence the charbon microbe passes through various degrees of attenuation, and like the microbe of chicken-cholera, each of these attenuated states can be reproduced by cultivation. Finally, since the charbon does not recur, each of our attenuated charbon microbes forms a vaccine for a superior microbe—that is, a vaccine fit to give a gentler disease. What is easier then than to find in the successive virus a virus fit to give the charbon fever to sheep, cows, horses, without killing them, and able to preserve them afterward from the deadly disease? We have practiced this operation on sheep with great success. As soon as the time of pasturage arrives in Beauce we shall try its application on a large scale.

Mr. Toussaint has already announced that sheep could be preserved by preventive innoculations; but when this able observer shall have published his result (on a subject on which we have made thorough studies not yet published), we will show the difference between the two methods; the uncertainty of one, the certainty of the other. The one we have made known has the great advantage of being based on the existence of vaccine virus, cultivable at will, and which can be multiplied to infinity in some hours without ever having recourse to charbon blood. The preceding facts suggest a problem of great interest,—I mean the possible return of the virulence of attenuated or extinct virus. We have obtained for example a charbon bacteria deprived of all virulence for the cobaya, rabbit, and sheep. Can we restore its activity for these animals? We have also prepared the microbes of chicken-cholera deprived of all virulence for chickens. How return to it a possibility of development in these gallinaceæ. The secret of return of virulence is at present entirely in successive cultivations in the bodies of certain animals. Our bacteria harmless to cobayas is not so at all ages of this animal; but how short is the period of virulence? A cobaya of several years' age, of one year, six months, one month, of some weeks, of eight days, of seven days, of six days, or even of less, runs no danger of sickness or death from inoculation with the attenuated bacteria, but surprising as it may seem it kills the cobaya one day old. If we pass then from one cobaya a day old to another, inoculating the blood of the first in the second; of the second in the third, and so on, the virulence of the bacteria is progressively strengthened; in other words, its custom of developing in the economy. Soon you can kill cobayas of three and four days' age, of a week, of a month, of many years, and finally sheep themselves. The bacteria has its original virulence. We may say without hesitation, although we have not yet tested it, that it would kill cows or horses; and that it would preserve its virulence indefinitely were nothing done to again attenuate it.

When the microbe of chicken-cholera has become inactive on chickens, its virulence is restored by acting on small birds, thrushes, canaries, sparrows, all of which it kills at once. Then by successive passages in the bodies of these animals, we give it slowly a virulence which can manifest itself again in adult chickens. Is it necessary to say that in this return to virulence we can prepare vaccine virus of all degrees of virulence, both with the bacteria and with the microbe of the chicken-cholera? This question of the return of virulence is of the greatest interest for the etiology of contagious diseases.

I closed my communication of 21st October last, with the remark that the attenuation of the virus by the air must be one of the factors in the extinction of great epidemics. The preceding facts in their turn serve to explain the so called spontaneous origin of these scourges. An epidemic that has expired by the attenuation of its virus may reappear by its becoming strengthened under certain influences. The accounts I have read of the spontaneous appearance of the plague seem to me to offer examples, as for instance the plague of Benghazi in 1856–58, whose occurrence could be connected with no original contagion. The plague is a virulent disease peculiar to certain countries. In all these countries its attenuated virus must exist, ready to take on active form when certain conditions of climate, famine, and misery occur anew. There are other virulent diseases which appear spontaneously in all countries, like camp typhus. Doubtless germs of microbes, which are the authors of these diseases, are spread everywhere. Man carries them upon himself or in his intestinal canal with little injury, but ready to become dangerous when by crowding and successive development at the surface of wounds in weakened or unweakened bodies, their virulence is progressively increased. This virulence appears in a new light, not undisturbing for humanity unless nature in its evolution through past centuries has (which is improbable) already met all occasions for the production of virulent or contagious diseases.

What is an inoffensive microscopic organism for man or a given animal? It is a being that cannot develop itself in our body or in that of the animal; but nothing proves that if this microscopic being penetrated one of the thousands of other species of creation, it might not give disease. Its virulence reinforced by successive passages through the representatives of this species might become able to attack animals of large size, such as man or the domestic animals. In this way new virulences and contagions might be created.

I am much inclined to believe that through the ages, variola, syphilis, plague, yellow fever, etc., have appeared, and that it is also by phenomena of this kind that great epidemics appear from time to time like that of typhus which I have mentioned.

The facts observed at the epoch of variolation (inoculation of variola) introduced into science the inverse opinion,—that of the possible diminution of virulence, by the passage of virus through certain subjects. Jenner thought so, and there is nothing improbable in it. Nevertheless we have thus far found no examples of it though we have intentionally sought for them.—*Comptes Rendus, February 28, 1881.*

ON THE LONG DURATION OF THE LIFE OF CHARBON GERMS, AND ON THEIR PRESERVATION IN CULTIVATED GROUND.—NOTE FROM M. PASTEUR, WITH THE ASSISTANCE OF CHAMBERLAND AND ROUX.

The central society of veterinary medicine of Paris formed last May a commission, and alloted the funds needed, to test the new facts, recently discovered in science, as to the etiology of charbon, especially the results relating to the presence of the germs of this disease, at the surface and in the ground where animals which have died of charbon have been buried. The society did me the honor of making me a member of the commission, which includes beside myself one associate, M. Bouly, M. Camille Leblanc, members of the Academy of Medicine, M. Traesbot, professor at the school of Alfort, and M. Cagny, a distinguished veterinary surgeon of Senlis.

It is proper to make known to the Academy some of the results attained by the commission.

At a few leagues from Senlis, the farm of Rosieres suffers yearly heavy losses from the charbon fever. Guided by the wise suggestions of M. Cagny this farm has been taken as the field for experiment by the commission.

In the garden, surrounded by walls, of this farm, are two places in some degree prepared for the studies which the commission wished to undertake. One place has served for burials for three years; the other was used twelve years ago and in preceding years, but has not since been used.

The commission charged me first to ascertain whether on the surface of these graves the soil contained charbon germs. For this purpose M. Leblanc sent me last September two small boxes, each containing about five grammes of earth separately taken from the surfaces of these graves. After washing and proper treatment of these soils we inoculated with their thinned parts some China [Guinea?] pigs which died rapidly and thoroughly diseased with charbon.

The commission then undertook the following experiment which was entrusted to two of its members, M. Leblanc and Cagny. On October 8, seven *new* sheep (that is, which had never had the charbon) were placed on the grave which was twelve years old. They were left there for some hours in the afternoon and then returned to the rest of the flock in the sheepfold. There was no grass on the surface of the grave and the sheep were only fed in the sheepfold.

On November 24, 1880, M. Leblanc, M. Cagny and myself went to Rosieres to verify the results obtained. Of the seven sheep one died October 24, a second November 8, both of charbon; the others were well. Of the test sheep, that is the rest of the flock, none had died in this time.

Here is then a new and valuable check upon the facts which we announced to the Academy in July last and more recently; with this very interesting double peculiarity, that in this case there was a momentary stay on the surface of a grave where no animals dying of charbon had been buried in twelve years, and that the sheep experimented with, of which two out of seven died in six weeks, did not eat upon the grave, whence it follows that the germs of the disease could only have entered their bodies in consequence of the well-known habit sheep have of incessantly licking the ground where they are kept.

It is not necessary to add that the deadly places of which I have spoken served as a vegetable garden for the farm. We asked the farmer whether the charbon had ever shown itself among the people of the farm. The farmer answered that is not certain: " I alone have had a malignant pustule which has healed, and you see the scar," showing his face. It may be presumed that if the vegetables eaten on the farm had not been cooked, the case would have been different, and the farm would, perhaps, have had victims of the terrible disease.

There is instruction of grave importance in the preceding facts. It has been believed that vegetation and cultivation by natural phenomena of combustion and assimilation destroy all organic matters in refuse or manures. A new principle is revealed to us: vegetable combustion and assimilation do not reach the germs of certain microscopic organisms. I do not think the etiology of transmissible disease has ever been enriched with a more fertile principle concerning the hygiene and prophylaxy of these terrible scourges. Who can state the paths, doubtless various and multiple, of germs from the moment of their formation, till that when they strike their victims, when these germs are the agents of contagion and of death?

The inhabitants of the farm of Rosieres trample under foot the charbon germs, which have attacked no one. But change slightly, as we have done, the conditions of life of the animals of the farm, and death is carried rapidly to some of them, whose flesh by one mode of transportation of the charbon germ or another, by direct wounds, or by indirect wounds by flies, will carry the disease to other animals and to men, as in the case cited of the farmer himself.—*Comptes Rendus, January 31, 1881.*

RESTRICTION AND PREVENTION OF DIPHTHERIA.

DOCUMENT ISSUED BY THE STATE BOARD OF HEALTH OF MICHIGAN, REVISED EDITION, 1881.

RESTRICTION OF DIPHTHERIA.

Diphtheria is a Contagious Disease, hence the strict observance of the following precautions is of very great importance:

1. When a child or a young person has a sore throat, bad odor to its breath, and especially if it has fever, it should immediately be kept separated from all other persons, except necessary attendants, until it be ascertained whether or not it has diphtheria or some other communicable disease.

2. **Every person known to be sick with diphtheria should be promptly and effectually isolated** from the public; no more persons than are actually necessary should have charge of or visit the patient, and they should be restricted in their intercourse with other persons.

3. **Plain and distinct notices should be placed upon the premises or house in which there is a person sick with diphtheria, and no child should be allowed to enter.**

4. **Every case of diphtheria should at once be reported to the health officer, or to the local board of health, as the law requires,** diphtheria being plainly a disease "dangerous to the public health," within the meaning of the law. Sections 1734 and 1735, compiled laws of 1871, are as follows:

Householder must notify the health officer.

(1734.) SEC. 43. Whenever any householder shall know that any person within his family is taken sick with the small-pox, *or any other disease dangerous to the public health,* he shall immediately give notice thereof to the board of health, or to the health officer of the township [city, or village*] in which he resides; and if he shall refuse or neglect to give such notice, he shall forfeit a sum not exceeding one hundred dollars.†

Physician must notify health officer.

(1735.) SEC. 44. Whenever any physician shall know that any person whom he is called to visit is infected with the small-pox, *or any other disease dangerous to the public health,* such physician shall immediately give notice thereof to the board of health, or health officer of the township [city, or village*] in which such diseased person may be; and every physician who shall refuse or neglect to give such notice, shall forfeit, for each offense, a sum not less than fifty nor more than one hundred dollars.†

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*See section 1740, compiled laws 1871, as amended by act No. 45, laws of 1879, the last part of which section is as follows: "(1740.) SEC. 49. * * * * * * The provisions of this chapter and the amendments thereto, shall, as far as applicable, apply to all cities and villages in this State, and all duties which are, by the provisions of this chapter, to be performed by the board of health of townships, or by the officers and inhabitants thereof, shall in like manner be performed by the board of health and the officers and inhabitants of such cities and villages, with a like penalty for the non-performance of such duties, excepting in cases where the charters of such cities and villages contain provisions inconsistent herewith."

†Supervisors must prosecute for all such forfeitures; township officers must give notice to supervisor; prosecuting attorney to conduct suit if requested; see sections 6852, 6853, and 6855, compiled laws of Michigan, 1871. Health officers of villages and cities must notify prosecuting attorney of all violations of this section,—see act No. 157, laws of 1879; the prosecuting attorney must prosecute for all such forfeitures incurred within his county.—see section 6855, compiled laws of 1871.

5. Upon receipt of such notice, the board of health has duties to perform in taking measures to restrict the spread of the disease, which it is a great violation of public trust for it to neglect or postpone. That no precious time may be lost, it is the duty of every board of health to make provision for prompt action by its health officer, authorizing and directing him to be prepared at all times, as executive officer of the board, to take certain action without waiting for a meeting of the board, whenever a case of diphtheria, scarlet fever, small-pox, or other disease dangerous to the public health occurs within its jurisdiction. Some of the duties of the local board of health relative to the restriction and prevention of diseases, are treated in circular 35 from the State board of health, which was also printed on pages 269–278 of the Report of the State board of health for 1879. Some of these duties of the health officer may be briefly suggested as follows: He should,—

a. Verify the diagnoses of reported cases of diphtheria and other diseases dangerous to the public health.

b. Secure isolation of those sick with or exposed to such a disease.

c. Give notice of infected places.

d. Regulate funerals of persons dead from diphtheria, etc.

e. Disinfect rooms, clothing, and premises.

f. Give certificates of recovery and of freedom from liability to communicate the disease.

Three sections of the law are as follows:

Notice of infected places.

(1732.) SEC. 41. When the small-pox, *or any other disease dangerous to the public health*, is found to exist in any township, *the board of health shall use all possible care to prevent the spreading of the infection* and to *give public notice of infected places* to travelers, by such means as in their judgment shall be most effectual for the common safety.

Board to make provision to prevent spread of diseases.

(1706.) SEC. 13. When any person coming from abroad or residing in any township within this State, shall be infected, or shall lately before have been infected, with the small-pox, *or other sickness dangerous to the public health*, the board of health of the township where such person may be shall make effectual provision in the manner in which they shall judge best for the safety of the inhabitants, by removing such sick or infected person to a separate house, if it can be done without danger to his health, and by providing nurses and other assistance and necessaries, which shall be at the charge of the person himself, his parents, or other person who may be liable for his support, if able; otherwise, at the charge of the county to which he belongs.

At expense of person or county. 3 Mich. Rep. 475.

Provision in case infected persons cannot be removed.

(1707.) SEC. 16. If any such infected person cannot be removed without danger to his health, the board of health shall make provision for him as directed in the preceding section, in the house in which he may be, and in such case they may cause the persons in the neighborhood to be removed, and may take such other measures as they may deem necessary for the safety of the inhabitants.

6. The room into which one sick with diphtheria is placed should previously be cleared of all needless clothing, carpets, drapery, and other materials likely to harbor the poison of the disease. This room should constantly receive a liberal supply of fresh air, without currents or drafts directly upon the patient. It will be well also to have the sun shine directly into the room.

7. The discharges from the throat, nose, and mouth are extremely liable to communicate the disease, and should be received in vessels containing a strong solution of copperas (sulphate of iron) or on soft rags or pieces of cloth, which should immediately be burned.

8. The discharges from the kidneys and bowels are also dangerous, and should be passed into vessels containing a strong solution of sulphate of iron

(copperas), and then be *buried* at least 100 feet distant from any well; or when this is impracticable they should be passed on old cloths, which should immediately be burned.

Sulphate of iron (copperas) dissolved in water in the proportion of one and a half pounds of the sulphate to one gallon of water is a good solution for chamber vessels, water-closets, etc. When much is wanted it may be prepared by hanging a basket containing about sixty pounds of copperas in a barrel of water.

9. The clothing, towels, bed-linen, etc., on removal from the patient should at once before removal from the room, be placed in a pail or tub of boiling-hot zinc-solution, made in proportion as follows: water, one gallon; sulphate of zinc, four ounces; common salt, two ounces.

10. Nurses and attendants should be required to keep themselves and their patient as clean as possible; their own hands should frequently be washed and disinfected by chlorinated soda.

11. All persons recovering from diphtheria should be considered dangerous; therefore such a person should not be permitted to associate with others, or to attend school, church, or any public assembly until the throat and any sores which may have been on the lips or nose are healed, nor until in the judgment of a careful and intelligent health officer he can do so without endangering others; nor until after all his clothing has been thoroughly disinfected, and this without regard to the time which has elapsed since recovery if the time is less than one year. Nor should a person from premises in which there is or has been a case of diphtheria attend any school, Sunday-school, church, or public assembly, or be permitted by the health authorities or by the school board to do so, until after disinfection of such premises and of the clothing worn by such person if it shall have been exposed to the contagion of the disease.

12. The body of a person who has died of diphtheria should be washed with a zinc solution of double the strength stated in paragraph 9, then wrapped in a sheet wet with the zinc solution, and at once be buried. In no case should the body be exposed to view.

13. No public funeral should be held at a house in which there is a case of diphtheria, nor in which a death from diphtheria has recently occurred. Except under extraordinary precautions there should be no public funeral of a person who has died from diphtheria. No child at least, and it would be better in most cases that few adults, should attend a funeral of a person dead of diphtheria.

DISINFECTION OF ROOMS, CLOTHING, ETC.

14. After a death or recovery from diphtheria, the room in which there has been a case of diphtheria, whether fatal or not, should, with all its contents, be thoroughly disinfected by exposure for several hours to strong fumes of burning sulphur, and then, if possible, it should for several hours or days be exposed to currents of fresh air.

a. Because of the innumerable ways in which the contagion may be scattered about the house and premises where there has been for some little time a case of diphtheria, the entire house and out-buildings, including cellar, garret, wood-shed, and privy, will usually need to be disinfected.

b. Rooms to be disinfected must be vacated. Heavy clothing, blankets, bedding, and other articles which cannot be treated with the zinc solution, should be spread out so as to be thoroughly exposed during fumigation, which should take place in the room where the clothing, etc., has been used in connection with the patient. For a room about ten feet square, at least two pounds of sulphur should be used; for larger rooms, proportionately increased quantities, at the rate of two pounds for each 1,000 cubic feet of air-space.

c. Close the rooms as tight as possible, place the sulphur in iron pans supported upon bricks, set it on fire by hot coals or with the aid of a spoonful of alcohol lighted by a match, be careful not to breathe the fumes of the burning sulphur, and when certain the sulphur is burning well, leave the room, close the door, and allow the room to be closed for twenty-four hours.

d. Care should be taken to secure the complete burning of as much of the sulphur as is possible. For this purpose the iron pan or pot in which the sulphur is to be placed may previously be heated, and may be placed in the room over hot coals in a pan of ashes set up on bricks.

e. Cellars, yards, stables, gutters, privies, cesspools, water-closets, drains, sewers, etc., should be frequently and liberally treated with copperas solution, made as described in paragraph 8.

f. *Body and bed-clothing, etc.*—It is *best* to burn all articles which have been in contact with persons sick with contagious or infectious diseases. [Articles to be burned should be thoroughly and quickly burned, so as to destroy and not diffuse the poison. In the glowing furnace under a large engine-boiler is a good place; if the burning be done in the open air it should be far from dwellings and by a quick, strong fire.] Articles too valuable to be destroyed should be exposed for one hour to a dry heat of from 240° F. to 250° F., or be treated as follows:

g. Cotton, linen, flannels, blankets, etc., should be treated with the boiling-hot zinc-solution, introducing them piece by piece, securing thorough wetting and boiling for at least half an hour. Heavy woolen clothing, silks, furs, stuffed bed-covers, beds, and other articles which cannot be treated with the zinc solution, should be hung in the room during fumigation, pockets being turned inside out and the whole garment being thoroughly exposed. Afterward they should be hung in the open air, beaten, and shaken. Carpets are best fumigated on the floor, but should afterward be removed to the open air and thoroughly beaten. Pillows, beds, stuffed mattresses, upholstered furniture, etc., after being disinfected on the outside, may be cut open and their contents again exposed to fumes of burning sulphur. In no case should the thorough disinfection of clothing, bedding, etc., be omitted. Infected clothing and bedding have been known to communicate diphtheria months after their infection.

The foregoing methods of disinfection are applicable in other contagious diseases.

TEMPORARY SHELTER DURING DISINFECTION.

15. Disinfection of a room always necessitates vacating it, and sometimes makes it impossible to remain in adjoining rooms, therefore in some cases it seems essential to have hospital, tent, or other temporary shelter for the inmates of infected houses, where bathing, disinfection, and washing can be done while such houses are being disinfected and put in order. On this subject local boards of health should be consulted, and should be prepared to act.

HOW TO AVOID AND PREVENT DIPHTHERIA.

16. Avoid the special contagium of the disease. This is especially important to be observed by children and all whose throats are sore from any cause. Children under ten years of age are in much greater danger of death from diphtheria than are adults; but adult persons often get and spread the disease, and sometimes die from it. Mild cases in adults may thus cause fatal cases among children. Because of these facts it is frequently dangerous for children to go where adult persons go with almost perfect safety to themselves.

17. Do not let a child go near a case of diphtheria. Do not permit any person or thing, or a dog, cat, or other animal to come direct from a case of diphtheria to a child. Unless your services are needed, keep away from the disease yourself. If you do visit a case, bathe yourself and change and disinfect your clothing before you go where there is a child.

18. It is probable that the contagium of diphtheria may retain its virulence for some time, and be carried a long distance in various substances and articles in which it may have found lodgment. Diphtheria contracted from germs carried several blocks in a sewer may perhaps be as fatal as when contracted by direct exposure to one sick with it. While it is not definitely proved that the germs of diphtheria are propagated in any substance outside the living human or animal body, it is possible that they may be found to be thus propagated. Therefore, and because the breathing of air laden with emanations from decaying fruit, vegetables, or meat, or from sewers, cess-pools, sinks, and other receptacles of filth, is believed to endanger health, great care should be taken to have the house, premises, and everything connected with dwellings kept clean and dry; to have sewer connections well trapped, and house-drains constantly well ventilated; and to have all carriers of filth well disinfected. Do not permit a child to enter a privy, water-closet, or breathe the air from a privy, water-closet, cess-pool or sewer into which discharges from persons sick with diphtheria have entered, nor to drink water or milk which has been exposed to such air.

19. Do not permit a child to ride in a hack or other closed carriage in which has been a person sick with diphtheria, except the carriage has since been thoroughly disinfected with fumes of burning sulphur, as specified in paragraphs 14, 14 *b*, 14 *c*, and 14 *d*.

20. All influences which cause sore throats probably tend to promote the taking and spreading of this disease. Among the conditions external to the body liable to spread diphtheria, perhaps the most common are: infected air, infected water, and *contact with infected substances or persons*. Because of this, and as a means of lessening the danger of contracting other diseases, the following precautions should always be taken, but more particularly during the prevalence of any such disease as diphtheria.

21. Avoid exposure to wind and to breathing cold, dry air; also the use of strong vinegar or any other article of food which tends to make the throat raw or tender.

22. Do not wear or handle clothing worn by a person during sickness or convalescence from diphtheria.

23. Beware of any person who has a sore throat. Do not kiss such a person or take his breath. Do not drink from the same cup, blow the same whistle, or put his pencil or pen in your mouth.

24. Beware of crowded assemblies in unventilated rooms.

25. Do not drink water which has a bad taste or odor, or which comes from a source that renders it liable to be impure, especially if there is reason to believe it may contain something derived from a person sick with diphtheria.

This document is published by the State Board of Health for distribution throughout the State A copy may be obtained by applying to the SECRETARY OF THE STATE BOARD OF HEALTH, LANSING, MICHIGAN.

The State Board of Health recommends that local boards of health procure and distribute copies of this document within their jurisdictions, especially when diphtheria is near. In order to facilitate such action, the State Board of Health has had the document stereotyped, and the plates placed in the hands of W. S. George & Co., Lansing, Michigan, who will supply any number of copies, on good book-paper, at rates as follows (cash to accompany order):

100 copies for	$1 75	400 copies for	$4 25
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300 " "	3 50	1,000 " "	8 00

In order that the document may do the greatest possible good, it is hoped that each one who receives it will not only make such use of it as will tend to disseminate most widely the suggestions and statements of fact contained therein, but will also *act for the restriction or prevention of this disease* in accordance with its suggestions, or by other effective measures.

After reading this document carefully, please preserve it for future reference.

RESTRICTION AND PREVENTION OF SCARLET FEVER.*

DOCUMENT ISSUED BY THE MICHIGAN STATE BOARD OF HEALTH.

[46.] (Revised Edition, 1881.)

1. **Scarlet Fever is believed to be one of the most contagious diseases.** One attack usually prevents subsequent attacks. The greatest number of deaths from this disease are of children under ten years of age. Adult persons sometimes have the disease; and even though they have it in many instances in a milder form, yet they may communicate the disease in a fatal form to children. The isolation of those mildly sick with, and convalescent from, scarlet fever, is important.

2. **Scarlet Fever is believed to be caused by a special contagium** or poison which may be conveyed, to persons previously unaffected, by personal contact, by infected clothing, rags, hair, or paper, or by any of the discharges from the body of a person affected with the disease.

3. **The discharges** from the throat nose and mouth are considered extremely dangerous, but those from the skin, eyes, ears, kidneys, and bowels, are also dangerous, and remain so for a considerable time.

4. **Communication.**—It is believed that the disease may be communicated by a person recovering therefrom so long as the usual subsequent scaling or peeling of the skin continues, which sometimes is not completed before the lapse of seventy or eighty days. The poison may also remain in clothing, etc., for a long time, possibly for years, especially if woolen and packed away in drawers or trunks.

5. **Filth, uncleanliness, and imperfect ventilation** may increase the danger of spreading the disease.

6. **Period of Incubation.** *The interval of time* which may elapse after exposure to the contagium of scarlet fever, and during which a susceptible person so exposed may expect to be taken sick with the disease, varies from one to fourteen days.

7. **Separation of the sick from the well.** Whenever a child has sore throat and fever, and especially when this is accompanied by a rash on the body, the child should immediately be isolated as completely as possible from other members

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* This disease is sometimes called "Scarlatina," "Scarlet Rash," "Canker Rash," or "Rash Fever."

of the household, and from other persons, until a physician has seen it and determined whether it has scarlet fever. **All persons known to be sick with this disease (even those but mildly sick) should be promptly and thoroughly isolated from the public.**

That this is of more importance than in the case of small-pox is indicated by the fact of the much greater number of cases of sickness and of deaths from scarlet fever—a disease for which no such preventive as vaccination is yet known.

8. **Persons who are attending** upon children or other persons suffering from scarlet fever, and also the members of the patient's family, should not mingle with other people nor permit the entrance of children into their house.

9. **Plain and distinct notices should be placed on the premises or house** in which there is a person sick with scarlet fever, and **no child that has not had the disease should be allowed to enter,** or to associate with persons who do enter such house or room.

10. **Children believed to be uninfected** may be sent away from the house in which there is scarlet fever, to families in which there are no persons liable to the disease, or to previously disinfected convalescent wards in hospitals; but in either case they should be isolated from the public until the expiration of the period of incubation, counting from the time of their removal.

11. **Householders and Physicians** must immediately give notice of the first case and of every case of scarlet fever, to the health officer or to the board of health,—scarlet fever being plainly a disease "dangerous to the public health," within the meaning of the law. Sections 1734 and 1735, compiled laws of 1871, are as follows:

Householder must notify the health officer.

(1734.) SEC. 43. Whenever any householder shall know that any person within his family is taken sick with the small-pox, *or any other disease dangerous to the public health*, he shall immediately give notice thereof to the board of health, or to the health officer of the township [city, or village*] in which he resides; and if he shall refuse or neglect to give such notice, he shall forfeit a sum not exceeding one hundred dollars.†

Physician must notify health officer.

(1735.) SEC. 44. Whenever any physician shall know that any person whom he is called to visit is infected with the small-pox, *or any other disease dangerous to the public health*, such physician shall immediately give notice thereof to the board of health, or health officer of the township [city, or village*] in which such diseased person may be; and every physician who shall refuse or neglect to give such notice, shall forfeit, for each offense, a sum not less than fifty nor more than one hundred dollars.†

12. **Upon receipt of such notice, the local board of health has duties to perform** in taking measures to restrict the spread of the disease, which it is a great violation of public trust for the board to neglect or postpone. The law is very plain as

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*See section 1740, compiled laws 1871, as amended by act No. 45, laws of 1879, the last part of which section is as follows: (1740.) "SEC. 49. * * * * * * The provisions of this chapter and the amendments thereto, shall, as far as applicable, apply to all cities and villages in this State, and all duties which are, by the provisions of this chapter, to be performed by the board of health of townships, or by the officers and inhabitants thereof, shall in like manner be performed by the board of health and the officers and inhabitants of such cities and villages, with a like penalty for the non-performance of such duties, excepting in cases where the charters of such cities and villages contain provisions inconsistent herewith."

†Supervisors must prosecute for all such forfeitures; township officers must give notice to supervisor; prosecuting attorney to conduct suit if requested; see sections 6852, 6853, and 6855, compiled laws of Michigan, 1871. Health officers of villages and cities must notify prosecuting attorney of all violations of this section,—see Act No. 157, Laws of 1879; the prosecuting attorney must prosecute for all such forfeitures incurred within his county,—see section 6855, Compiled Laws of 1871.

to the nature and the importance of these duties. Three sections of the law are as follows:

> (1732.) Sec. 41. When the small-pox, *or any other disease dangerous to the public health*, is found to exist in any township, *the board of health shall use all possible care to prevent the spreading of the infection*, and to *give public notice of infected places* to travelers, by such means as in their judgment shall be most effectual for the common safety.
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> Notice of infected places.
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> (1706.) Sec. 15. When any person coming from abroad or residing in any township within this State, shall be infected, or shall lately before have been infected, with the small-pox, *or other sickness dangerous to the public health*, the board of health of the township where such person may be shall make effectual provision in the manner in which they shall judge best for the safety of the inhabitants, by removing such sick or infected person to a separate house, if it can be done without danger to his health, and by providing nurses and other assistance and necessaries, which shall be at the charge of the person himself, his parents, or other person who may be liable for his support, if able; otherwise at the charge of the county to which he belongs.
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> Board to make provision to prevent spread of disease.
>
> At expense of person or county. 3 Mich. Rep. 475
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> (1707.) Sec. 16. If any such infected person cannot be removed without danger to his health, the board of health shall make provision for him as directed in the preceding section, in the house in which he may be, and in such case they may cause the persons in the neighborhood to be removed, and may take such other measures as they may deem necessary for the safety of the inhabitants.
>
> Provision in case infected persons cannot be removed.

13. **Some of the duties of the local board of health, and of the health officer,** relative to the restriction and prevention of diseases, are treated in Circular 35, from the State Board of Health, which was also printed on pages 269–278 of the Report of the Board for 1879. In order that no time may be lost, it is the duty of every board of health to make provision for prompt action by its health officer, authorizing and directing him to be prepared at all times, as executive officer of the board, to take certain action without waiting for a meeting of the board, whenever a case of scarlet fever, diphtheria, small-pox, or other disease dangerous to the public health occurs within its jurisdiction. Some of these duties of the health officer may be briefly suggested as follows: He should—

a. Verify the diagnoses of reported cases of scarlet fever and other diseases dangerous to the public health, that is (if he has any reason to distrust the report), find out whether the person actually has the disease reported.

b. Secure isolation of those sick with or exposed to such a disease.

c. Give notice of infected places.

d. Regulate funerals of persons dead from scarlet fever, etc.

e. Disinfect rooms, clothing, and premises.

f. Give certificates of recovery and of freedom from liability to communicate the disease.

14. **The local board of health and the physician in charge of cases** of this disease should co-operate for its restriction. The local board of health should especially guard against its spread by cases where no physician is employed.

15. **The room into which one sick with this disease is placed** should previously be cleared of all needless clothing, carpets, drapery, and other materials likely to harbor the poison of the disease, except such articles as are essential to the well-being of the patient. The sick room may have no carpet, or only pieces which can afterwards be destroyed. Provision should be made for the introduction of a liberal supply of fresh air and the continual change of the air of the room without sensible currents or drafts.

16. **Handkerchiefs,** that need to be saved, should not be used by the patient; small pieces of rag should be substituted therefor, and after being once used should be immediately burned.

17. **Soiled clothing, towels, bed-linen, etc.,** on removal from the patient should at once, before removal from the room, be placed in a pail or a tub of boiling-hot zinc-solution, made in proportions as follows: water, one gallon; sulphate of zinc, four ounces; common salt, two ounces,

18. **The discharges** from the throat, nose, mouth, and from the kidneys and bowels of the patient should be received into vessels containing chlorinated lime (commonly called "chloride of lime") or sulphate of iron,* or the zinc-solution mentioned in paragraph 17, and in cities where sewers are used thrown into the water closet; elsewhere the same should be buried at once at least 100 feet distant from any well, and should not by any means be thrown into a running stream, nor into a cesspool or privy, except after having been thoroughly disinfected. Discharges from the bladder and bowels may be received on old cloths, which should immediately be burned—or disinfected and buried. All vessels should be kept scrupulously clean and disinfected. Discharges from the nose, ears, etc,, may be received on soft rags or pieces of cloth, which should immediately be burned.

19. If the attending physician shall think best for the patient, an effort to prevent the spreading of the contagious particles thrown off from the skin may be made by annointing the body with oil, vaseline, etc., as the physician may direct.

20. **All cups, glasses, spoons, etc.,** used in the sick-room, should at once on removal from the room be washed in the zinc-solution mentioned in paragraph 17, and afterwards in hot water, before being used by any other person.

21. **Food and drink** that have been in the sick room, or otherwise infected with scarlet fever, should be destroyed or buried. It is best that it should not be put in the swill-barrel.

22. **Perfect Cleanliness** of nurses and attendants should be enjoined and secured. As the hands of nurses of necessity become frequently contaminated by the poison of the disease, a good supply of towels and basins,—one containing a solution of chlorinated soda (Labaracque's solution), chlorinated lime, or the disinfecting zinc solution, and another for plain soap and water, —should always be at hand and freely used.

23. **Persons recovering from scarlet fever should be considered dangerous** and therefore **should not attend school, church, or any public assembly, or use any public conveyance,** so long as any scaling or peeling of the skin (see paragraph 4), soreness of the eyes or air-passages, or symptoms of dropsy remain. A person recovering from scarlet fever should not thus endanger the public health nor appear in public until after having taken four times, at intervals of two days, a thorough bath. The hair should be thoroughly washed. This cleansing, however, should be deferred until the physician in charge considers it prudent. After recovery from scarlet fever, no person should appear in public wearing the same clothing worn while sick with or recovering from this dis-

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* Carbolic acid in dilute form, as generally used, is not believed to be a disinfectant. Sulphate of iron (copperas) dissolved in water in the proportion of one and a half pounds of the sulphate to one gallon of water, is a good solution for chamber-vessels, water-closets, etc. When much is wanted it may be prepared by hanging a basket containing about sixty pounds of copperas in a barrel of water.

ease, except such clothing as has been thoroughly disinfected, and this without regard to the time which has elapsed since recovery. Nor should a person from premises in which there is or has been a case of scarlet fever attend any school, Sunday-school, church, or public assembly, or be permitted by the health authorities or by the school board to do so, until after disinfection of such premises and of the clothing worn by such person if it shall have been exposed to the contagion of the disease.

24. **The body** of a person who has died of scarlet fever should be wrapped in a cloth wet with a zinc solution of double the strength stated in paragraph 17, and with as little delay as possible be privately buried.

25. In order to prevent attendance at the funeral or visits to the house, **newspaper notices of such deaths** should state that the deceased person died of scarlet fever.

26. **Burial of the dead** from scarlet fever should be private, and the body should not be exposed to view.

DESTRUCTION OR DISPOSAL OF CLOTHING, BOOKS, FURS, ETC.

27. **Clothing, carpets, curtains, furniture,** and other substances that are to be destroyed should be dealt with in a way to avoid conveying the poison to any person in the process; they should not be simply thrown away, or into some stream or body of water; and if burned should be completely burned and not partly burned and partly warmed or dealt with in a way to spread the poison of the disease.

28. **All infected substances, which are not destroyed,** should be either thoroughly boiled, subjected to a dry heat of 250° F. in a disinfecting oven, or be thoroughly exposed to fumes of burning sulphur, and afterwards exposed to open air currents for some days. Books and furs that have been used or handled by those convalescing from this disease are particularly liable to convey the poison to children who have never had the disease. Great care should be used to thoroughly disinfect any such articles that are not destroyed; and caution should be exercised before allowing children who have not had scarlet fever to handle any such articles that have been used by persons liable to communicate the disease.

DISINFECTION OF ROOMS, CLOTHING, ETC.

29. **Aerial disinfection or fumigation** can be completely and entirely effectual only in the absence of living persons, as heat or fumes strong enough for the purpose are destructive of human life. This need not deter from doing so much as is possible, without injury to sick persons, for the purification of the air of rooms occupied by them,—a liberal supply of pure air should be secured; but after the death or recovery from scarlet fever, the room in which there has been a case of this disease, the furniture, and other contents not to be destroyed, should be thoroughly exposed for several hours to fumigation by burning sulphur, and then, if possible, it should for several hours or days be exposed to currents of fresh air.

30. **When a room and contents are to be disinfected,** all articles therein should be spread out so as to expose the greatest amount of surface to the action of the disinfectant, and all openings to the room should be closed.

a. Because of the innumerable ways in which the contagion may be scattered about the house and premises where there has been for some little time a case of scarlet fever, the entire house and out-buildings, including cellar, garret, wood-shed, and privy, will usually need to be disinfected, and always should be aired by opening them to the air for several days as thoroughly as possible.

b. Rooms to be disinfected must be vacated. Heavy clothing, blankets, bedding, and other articles that cannot be treated with the zinc-solution, should be spread out so as to be thoroughly exposed during fumigation, which should take place in the room where the clothing, etc., has been used in connection with the patient. For a room about ten feet square, at least two pounds of sulphur should be used; for larger rooms, proportionately increased quantities, at the rate of two pounds for each 1,000 cubic feet of air-space.

c. Close all openings into the room as tight as possible, place the sulphur in an iron pot or pan supported upon bricks, set it on fire by hot coals or with the aid of a spoonful of alcohol lighted by a match; be careful not to breathe the fumes of burning sulphur, and when certain the sulphur is burning well, leave the room, close the door, and allow the room to be closed for twenty-four hours.

d. Care should be taken to secure the complete burning of as much of the sulphur as is possible. For this purpose the iron pan or pot in which the sulphur is to be placed may previously be heated, and may be placed in the room over hot coals in a pan of ashes set up on bricks.

e. Privies, water-closets, cess-pools, gutters, drains, sewers, etc., should be frequently and liberally treated with copperas solution, made as described in the foot-note to paragraph 18.

f. Body and bed-clothing, etc.—It is *best* to burn all articles of small value which have been in contact with persons sick with contagious or infectious diseases. [See paragraphs 27 and 28.] Articles too valuable to be destroyed should be exposed in a disinfecting-oven for one hour to a dry heat of from 240° F. to 250° F., or be treated as follows:

g. Cotton, linen, flannels, blankets, etc., should be treated with the boiling-hot zinc-solution, introducing them piece by piece, securing thorough wetting and boiling for at least half an hour. Heavy woolen clothing, silks, furs, stuffed bed-covers, beds, and other articles which cannot be treated with the zinc-solution, should be hung in the room during fumigation, pockets being turned inside out and the whole garment being thoroughly exposed. Afterward they should be hung in the open air, beaten and shaken. Carpets are best fumigated on the floor, but should afterward be removed to the open air and thoroughly beaten. Pillows, beds, stuffed mattresses, upholstered furniture, etc., after being disinfected on the outside, may be cut open and their contents again exposed to fumes of burning sulphur. In no case should the thorough disinfection of clothing, bedding, etc., be omitted. Infected clothing and bedding have been known to communicate scarlet fever months after their infection.

The foregoing methods of disinfection are applicable in other contagious diseases.

31. **Fresh air.**—Although not so active for the destruction of the contagium as is sulphurous acid gas, pure air, in liberal amount, is very useful for the dilution of the poison of the disease; it should be employed freely; but with this as with other procedures for the safety of the unaffected, great care should be taken not to increase the danger to those already sick, who are usually endangered by exposure to drafts of cold air, and this is especially true of persons convalescing from scarlet fever.

TEMPORARY SHELTER DURING DISINFECTION.

32. Disinfection of a room always necessitates vacating it, and sometimes makes it impossible to remain in adjoining rooms, therefore in some cases it seems essential to have hospital, tent, or other temporary shelter for the inmates of infected houses, where bathing, disinfection, and washing can be done while such houses are being disinfected and put in order. On this subject local boards of health should be consulted, and should be prepared to act.

HOW TO AVOID AND PREVENT SCARLET FEVER.

33. Avoid the special contagium of the disease. This is especially important to be observed by children and all whose throats are sore from any cause. Children under ten years of age are in much greater danger of death from scarlet fever than are adults; but adult persons often get and spread the disease and sometimes die from it. Mild cases in adults may thus cause fatal cases among children. Because of these facts it is frequently dangerous for children to go where adult persons go with almost perfect safety to themselves.

34. Do not let a child go near a case of scarlet fever. Do not permit any person or animal to come or anything to be brought directly from a case of scarlet fever to a child. Unless your services are needed, keep away from the disease yourself. If you do visit a case, bathe yourself and change and disinfect your clothing before you go where there is a child.

35. It is probable that the contagium of scarlet fever may retain its virulence for some time, and be carried a long distance in various substances and articles in which it may have found lodgment. While it is not definitely proved that the germs of scarlet fever are propagated in any substance outside the living human or animal body, it is possible that they may be found to be thus propagated. Therefore, and because the breathing of air laden with emanations from decaying meat, or from sewers, cess-pools, sinks, and other receptacles of filth is believed to endanger health, great care should be taken to have the house, premises, and everything connected with dwellings kept clean and dry; to have sewer connections well trapped, and house drains constantly well ventilated; and to have all carriers of filth well disinfected. Do not permit a child to enter a privy or water-closet, or breathe the air from a privy, water-closet, cess-pool, or sewer into which non-disinfected discharges from persons sick with scarlet fever have entered, nor to drink water or milk which has been exposed to such air.

36. Do not permit a child to ride in a hack or other closed carriage in which has been a person sick with scarlet fever, except the carriage has since been thoroughly disinfected with fumes of burning sulphur, as specified in paragraphs 29 and 30.

37. All influences which cause sore throats probably tend to promote the taking and spreading of this disease. Among the conditions external to the body liable to spread scarlet fever, perhaps the most common are: infected air, infected water, and *contact with infected substances or persons.* Because of this, and as a means of lessening the danger of contracting other diseases, the following precautions should always be taken, but more particularly during the prevalence of any such disease as scarlet fever.

38. Avoid exposure to wind and to breathing cold, dry air; also the use of strong vinegar or any other article of food which tends to make the throat raw or tender.

39. Do not wear or handle clothing worn by persons during their sickness or convalescence from scarlet fever.

40. Beware of any person who has a sore throat. Do not kiss such a person, nor take the breath of such a person. Do not drink from the same cup, nor use any article that has been used by a person sick with scarlet fever.

41. Beware of crowded assemblies in unventilated rooms.

42. Do not drink water which has a bad taste or odor, or which comes from a source that renders it liable to be impure, especially if there is reason to believe it may contain something derived from a person sick with scarlet fever.

With the view of lessening the number of cases of and deaths from scarlet fever in Michigan, the foregoing is published by the STATE BOARD OF HEALTH for free distribution throughout the State, especially to officers and members of local boards of health. Physicians being to some extent the custodians and conservators of the public health, copies of this document are also sent to physicians in Michigan, in the hope that they will aid in diffusing among the people such knowledge of the nature of scarlet fever as will enable the people better to co-operate with them and with boards of health for the restriction of the disease and a decrease of sickness and deaths therefrom.

Any communication upon the subject may be addressed to: OFFICE OF STATE BOARD OF HEALTH, LANSING, MICHIGAN, from which, on application, any person may obtain a copy of this document, or of a similar document on the Restriction and Prevention of Diphtheria.

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It cannot be expected that the distribution by the State Board will reach all of the one and a half million of people in Michigan, therefore the State Board of Health recommends that local boards of health procure and distribute copies of this document within their health districts, especially when scarlet fever is near. In order to facilitate such action, the State Board of Health has had the document stereotyped, and the plates placed in the hands of W. S. George & Co., Lansing, Michigan, who will supply local boards and others with any number of copies, on good book paper, at rates as follows (cash to accompany order):

100 copies for	$1 75	400 copies for	$4 25
200 " "	2 50	500 " "	4 75
300 " "	3 50	1,000 " "	8 00

In order that the document may do the greatest possible good, it is hoped that each one who receives it will not only make such use of it as will tend to disseminate most widely the suggestions and statements of fact contained therein, but will also *act for the restriction or prevention of this disease* in accordance with its suggestions, or by other effective measures.

After reading this document with sufficient care to remember the principles involved please preserve it for future reference.

CONTAGIOUS DISEASES.

SCARLET FEVER, DIPHTHERIA, SMALL-POX, TYPHUS FEVER, ETC.*

GENERAL RULES FOR THEIR PREVENTION AND RESTRICTION.

ISSUED BY THE MICHIGAN STATE BOARD OF HEALTH.
[47.] [Dec. 1881.]

1. **Avoid** the contagium or special cause of the disease. Do not take the breath of one sick. Unless you are needed to care for the sick, or are protected by having had the disease, or in case of small-pox by thorough vaccination, do not go near the sick person. Do not allow your lips to touch any food, cup, spoon, or anything else that the sick person has touched or that has been in the sick room. Do not wipe your face or hands with any cloth that has been near the sick person. Do not wear any clothing the sick person has worn, during, just before, or just after his sickness. Keep your hands free from discharges from the body or skin of the sick person. Do not touch him with sore or scratched hands. Particularly avoid inhaling or in any way receiving into the mouth or nose the branny scales that fall off or peal off from one recovering from, or apparently wholly recovered from scarlet fever.

2. **Restrict** the contagium or special cause of the disease. Isolate the sick. Separate those sick with any of these diseases, even if they are but mildly sick, from all persons except necessary attendants. A person sick with any of these diseases should not be permitted to suffer from want of care, food, or comfort; but all his wants should be attended to by adults, or by those who are protected by proper vaccination or by having had the disease. Children and those who are not thus protected, should be kept away from these diseases. Do not go from the sick-room to a child or other unprotected person until after change of

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* Consumption is now believed to be a communicable disease, therefore many of these rules are applicable for its prevention and restriction.

Whooping-cough is a communicable disease which, in Michigan, causes more deaths than does small-pox. Most of these rules, except perhaps those for disinfection of the discharges from the kidneys and bowels, are applicable for its prevention and restriction.

As regards small-pox, these rules are applicable whenever the disease occurs, but by vaccination and re-vaccination small-pox may be almost wholly prevented.

clothing and thorough washing of hands, face, hair, and beard. Always wash the hands thoroughly after any necessary handling of the sick person or of anything that has been in contact with the sick person. Keep those who have been exposed to any of these diseases away from schools, churches, and other assemblies, and from all children, until it is known whether they are infected,—if they are found to be infected, isolate them till after complete recovery and thorough disinfection.

3. **Destroy** the contagium or special cause of the disease.

a. By thoroughly disinfecting or destroying whatever is removed from the person sick or from the sick-room. All discharges from the patient should be received into vessels containing a strong solution of sulphate of iron (copperas), and then, in cities, thrown into the water-closet; elsewhere they should be buried at least 100 feet distant from any well; or where this is impracticable they should be received on old cloths which should immediately be burned or disinfected and buried.

b. By thoroughly disinfecting the sick-room and its contents, after removal of the sick person, whether by death or recovery.

Disinfect as follows: Burn whatever has been in contact with the sick person and is not too valuable to burn. Garments, sheets, blankets, etc., that will not be injured by bleaching, should be boiled for half an hour in a zinc-solution made by dissolving zinc sulphate and common salt in water, in the proportion of four ounces of the zinc sulphate and two ounces of common salt to one gallon of water. Hang up and loosely spread out clothing, bedding, etc., that cannot be boiled in the zinc-solution, or spread it loosely over chairs in the sick-room, leaving the bedstead and other furniture in the room. Close all openings to the room very tight. For a room ten feet square place two pounds of sulphur in an iron pot or pan supported on bricks. Set the sulphur on fire with live coals or with a spoonful of alcohol lighted by a match. Be careful not to breathe the sulphurous fumes. Leave the room tightly closed for several hours, then air it thoroughly. For a larger room use a proportionally larger quantity of sulphur at the rate of two pounds for each 1,000 cubic feet of air-space, and try to burn as much as possible of the sulphur used.

4. Keep your house and premises and everything connected therewith clean, but remember that *the contagium of these diseases may attach to the cleanest article* of clothing, food, drink, book, or paper if it is exposed thereto.

The law requires householders and physicians to notify the local board of health of the first case and of every case of these diseases.

When the death of a person who has died from scarlet fever, diphtheria, or small-pox is announced in print, the notice should state the cause as "from scarlet fever," diphtheria, or small-pox, as the case may be, to prevent attendance at the funeral or visits to the house by persons liable to take the disease.

For more complete statements of means for restricting and preventing these diseases, see the State Board of Health documents on the Restriction and Prevention of Scarlet Fever, the Restriction and Prevention of Diphtheria, and the Restriction and Prevention of Small-pox, which may be had by addressing the Secretary of the State Board of Health, Lansing, Michigan.

RELATION OF PREVENTABLE SICKNESS TO TAXATION.

BY JOHN H. KELLOGG, M. D., OF BATTLE CREEK, MICH.

In my effort to perform the duty expected of me as the committee on the Relation of Preventable Sickness to Taxation, I have met with no little embarrassment in the fact that the statistics upon which a report upon this subject should be based are most conspicuous by their absence; and yet the nature of the information desired is inaccessible in any other way than through statistics collected and reported in accordance with the requirements of the laws of the State. The failure of the various officers whose duty it is to make statistical returns, to do so in a full and reliable manner, serves to vitiate in some degree the meager data to be derived from the only sources of information available, although perhaps the really greatest obstacle in the way is the want of proper laws providing for the collection of the data most needed. I have, however, endeavored to make such use of statistical data as to eliminate as fully as possible sources of error, and make the results sufficiently reliable to give at least an approximation to the truth. We ought not, in justice to the work of our statisticians, to neglect the fact that all the data we have is what can be derived from the statistical records of the State, so that these, imperfect as they are in many particulars, are yet invaluable.

The materials which I have employed have been chiefly the "Biennial Reports of the Board of Corrections and Charities," the Abstracts of Reports of County Superintendents of the Poor, the Annual Abstracts of Statistical Information Relative to the Insane, Deaf, Dumb, and Blind, of the State of Michigan, and the Annual Registration Reports prepared by the Secretary of this Board.

The first question to be settled is, "What shall be considered as preventable diseases," in this investigation? In the light of modern researches respecting the nature of disease and its relation to physical causes, it is evident that nearly all diseases of every description are clearly preventable. The ancient notion that diseases are the inflictions of demons, benign or malignant, faded away with the mists of the Dark Ages; and though numerous subtle forms of the theory survived in various medical doctrines till near the present day, the modern discovery of germs and microscopic life and their relation to the human body, and the study of various causative influences too numerous to mention in this connection, and the more recent comparative investigation of meteorology and vital statistics conducted by this Board under the direction of its Secretary, Dr. H. B. Baker, have settled beyond the possibility of question, the fact that disease is not an infliction, but, in the great majority of instances, is a disarrangement of the bodily functions the prevention of which in most cases lies within the power of the individual.

In this investigation, however, we will confine ourselves, at first, at least, to the consideration of such diseases as are believed to be readily preventable by such means as can be easily commanded by the proper authorities. In this class, we may safely include the following maladies: diphtheria, scarlet-fever, small-pox, chicken-pox, whooping-cough, typhoid and typhus fevers, erysipelas, puerperal fever, croup, cerebro-spinal meningitis, cholera, and dysentery. With one exception, all of these maladies belong to the *zymotic* group of diseases; and while all are not clearly proved to be either infectious or contagious, the causation of each is sufficiently well settled to make it clear beyond question that insanitary conditions constitute a prime factor in the development of the disease and particularly in increasing its fatal tendencies. Hence it is wholly allowable to consider them as preventable diseases, since the fatality arising from them would almost wholly disappear were the proper sanitary precautions taken. Perhaps the greatest question would arise respecting the affection known as cerebro-spinal meningitis. There is not wanting, however, high medical authority respecting the causation of this malady which justifies this classification of the disease, as do also many of its well-known characteristics. Under this name we have also included the cases reported as spinal fever, spinal meningitis, and spotted fever, considering these to be only other names for the same malady. Tubercular consumption, venereal diseases, and, in part, insanity and diseases arising from intemperance, might perhaps with propriety be included in the list; but for the present, at least, we will confine the consideration to the first-named diseases.

Our next inquiry shall be as to the number of persons who are led to seek assistance from the State in consequence of indigence arising from sickness with the above-named diseases. The whole number of inmates of the various poorhouses of the State during the year 1879–80 was 7,806, of whom 1,172 were reported to have become dependents of the State through sickness, although the nature of the disease is stated in but a small proportion of the cases. We need some means of determining the probable number of cases of preventable diseases, at least, approximately. This we find in a study of the causes of death as given in the Registration Reports. By reference to the Report for 1874, the last published, we find that out of 12,500 deaths 2,315, or 18½ per cent were from the enumerated diseases. Assuming that the same proportion of cases reported in the returns of the superintendents of the poor, were of a preventable character, we find that 216 persons or about 2¾ per cent of the whole number of inmates of the poorhouses of the State, became such by sickness directly and immediately traceable to preventable maladies as previously defined.

The number of inmates of poorhouses, however, represents but a small proportion of the whole number of persons in whole or in part dependent upon the State for support. According to the published reports of the county superintendents of the poor during the year 1879–80 there were 36,650 permanent and transient paupers outside the poorhouses. The cause of indigence is reported in the cases of only 6,415, being in 2,900 of the number "sickness" or "death." Applying the same rule as before, we obtain a percentage of 8⅓ of preventable illness, which would give 3,054 cases of preventable disease. This number may seem somewhat unexpectedly large, but it is not improbable, when we take into consideration the serious character of most contagious and infectious diseases, and the frequency with which they leave their victims maimed or otherwise disabled for life.

But still we have not learned the full number of State dependents who owe their helplessness to diseases which by the employment of proper measures might have been prevented. According to the last annual report of the State Board of Corrections and Charities, there were treated at the two asylums for the insane in this State, last year, 1,208 patients, fully one per cent of whom were deprived of their reason and rendered dependent by maladies which were wholly preventable. This is as the matter appears in the report; but as no cause whatever is assigned in a large number of cases, and simply sickness, without any specification of the nature of the disease in many others, it is not at all improbable that double the percentage named owed their condition to the cause under consideration. We may safely say then, that at least twenty-four out of the 1,200 belong in this category.

Still another addition must be made to the list of unfortunates. According to the same report from which the above facts are gleaned, 70, or one-third of the 210 pupils at the Institution for the Deaf and Dumb, at Flint, owe their condition to diseases of a preventable character.

Lastly, an examination of the report relative to the blind shows that at least seven per cent of the number under treatment at the State institution at Flint attributed their misfortune to the same causes.

The aggregate of these several classes is 3,367,—an appalling army of maimed, crippled, deaf, dumb, blind, insane, and helpless creatures, dependent upon the tender mercies of the State for shelter, food, and all other of the few comforts of life they are permitted to enjoy.

But we have not yet learned the whole of the sad truth. Although the facts stated indicate the minimum number of those who have become dependent upon the State through preventable sickness, there are yet many more who are equally helpless, but more fortunate in having wealthy relatives who are competent to care for them without burdening the State. The full number of these is not known; but according to the official returns, there are no less than 650 deaf and dumb persons in the State, of whom only 210 are cared for in the State institution, leaving 440 to be cared for by friends, so far as they are unable to maintain themselves. Of this number one-third, or 143, are known to be the result of unnecessary and easily preventable diseases. There are also 499 blind persons in the State, only 49 of whom are under tuition or treatment at the State's expense, leaving 450, of whom 31 were made blind by the diseases considered in this paper as preventable. The number of this class of unfortunates is still further augmented by a number of persons who are partially deaf or deaf and dumb, 38 of whom suffer in consequence of such maladies as measles, scarlet fever, and cerebro-spinal meningitis, and nearly an equal number of partially blind persons, of whom six trace their condition to the same causes, together with 330 idiots and imbeciles, and 226 epileptics, of whom at least two per cent might have been to-day in the enjoyment of healthy minds and bodies had proper preventive measures been employed.

Here we have a grand total of 3,564 persons who have been deprived of one or more of the priceless faculties pertaining to physical and mental health, and rendered burdens to themselves, to society, and to the State by unnecessary and preventable illness.

Now we are prepared for the consideration of the inquiry toward which this paper is particularly directed: *How much does this unnecessary sickness cost the State?*

Referring to the same public documents which have furnished us the foregoing facts, we find data sufficient to enable us to approximate very closely the cash expenditure on the part of the State in behalf of these the most sadly unfortunate of its dependents. According to the last report of the State Board of Corrections and Charities, the cost of maintaining the poor during the year was $542,586. As before shown two and three-fourths per cent of the whole number were rendered dependent by preventable sickness; hence we should charge to the account of preventable diseases two and three-fourths per cent of this sum, or in round numbers, $15,000.

The cost of maintaining the insane poor at the two asylums, exclusive of officers' salaries, repairs, etc., is reported to be $170,000, of which two per cent, or $3,700, must be added to the preceding amount. We must also add further one-third the expense of the instruction of the deaf and dumb at the Flint institution, or $10,000, and seven per cent of the expenses of instructing the blind pupils, or $525.

This aggregates a net expense to the State for the poor, deaf, dumb, blind, and insane—made such by preventable sickness—in round numbers, of $29,000.

But this estimate of expense is by no means complete. We must not forget that the State has been very lavish in her provisions for the comfort and convenience of these unfortunate persons, after it is too late, in most cases, to repair the loss which they have suffered. In the two asylums for the insane, the munificent sum of $1,267,000 has been expended, two per cent of which is solely for the benefit of persons suffering from the effects of unnecessary illness, equaling the sum of $25,340. In the different counties of the State there is invested in property connected with the county poor-houses the sum of $707,750, of which two and three-fourths per cent, or $20,000, is for the same purpose. Of the $441,000 invested in the Flint institution for the deaf and dumb, one-third, or $147,000, is necessitated by cases resulting from preventable sickness. Thus we have invested in the various charitable institutions of the State for the benefit of paupers who were not made such through any dispensation of Providence, through accident, or through ill-inheritance, but through needless ignorance or neglect, the sum of $192,000. To the previously enumerated expenses must be added the annual interest on this sum at seven per cent, or $13,440, making a grand total of unnecessary expense of over $42,000.

It may be suggested that this sum is a small item in the bill of expenses of a great State. This may be true, but are there not many purposes to which the State might apply these thousands which would aid in the material, mental, or moral advancement of its citizens? The immense capital invested in unproductive institutions for the benefit of persons made dependent by preventable diseases, would, if placed at interest, in a few years amount to millions.

But the greatest loss by means of unnecessary illness is not yet apparent, for we have not, thus far, taken any account of the enormous loss to the State and to the world in the death of useful citizens, producers of taxable property, creators of wealth. How much is a human being worth? Who can estimate the value of a human life? How much wealth will atone for the loss of a friend, a father, a mother, a sister, brother, or child? But the State knows nothing of the ties of friendship or kindred. This consideration must take into account only the actual cash value to the State of a human life. But even this is difficult to estimate. No one knows how many brilliant intellects, gifted with rare genius for invention, for discovery, for developing new wealth which may now remain forever hidden, having been sacrificed in the annual holocaust to ignorance or negligence of the use of preventive measures against the most deadly foes to human life. But leaving out of the consideration extraordinary gifts, how much may we estimate the cash value to the State of the average human life? Without professing to fix the sum exactly, suppose we estimate the value of a life at $1,000. This sum will certainly be considered too small, but we will take it as a basis for further calculations, as we wish to make our estimate such as no one will be inclined to depreciate.

As before stated, the number of deaths from diseases, classed in this paper as preventable, during the year 1874, as reported, was 2,315. The superintendent of vital statistics states in his report, however, that he has good reason to believe that the number of deaths reported should be increased 61 per cent on account of the incompleteness of the returns. Adding 61 per cent gives us 3,727 as the probable number of deaths from causes readily preventable during the year 1874. Considering the death-rate to be the same for 1880 as for 1874, and increasing the above figures in proportion to the increase in the population between 1874 and 1880, we have 4,585 as the probable number of deaths from preventable diseases in the year 1880. In accordance with our estimate that each of these human lives would have been worth to the State the sum of $1,000, it is evident that the State has met with a loss of not less than $4,585,000.

Still we have not reached the grand total of this enormous waste of human life and the material wealth of the State. According to the English parliamentary reports on benefit societies, there are two persons sick throughout the year for each person who dies, not including a large number of cases of slight ailments and chronic diseases. This would indicate a total loss of a year's time on the part of 9,170 persons, due to preventable sickness. The expenses of each sick person could not be estimated at less than $200 each for a year's sickness, which aggregates $1,834,000. This sum added to the previous footing gives the enormous sum of $6,419,000. Adding $40,000, the amount of loss previously shown, we have a total of $6,461,000, which represents not a hypothetical, but an actual loss to the State, a large part of which must of course be replaced by taxation; and this loss does not occur once only, or once in a century or decade, but ANNUALLY, and *is increasing each year at a most alarming ratio.*

But still the whole story is not told. Every physician of experience will readily admit that nearly all diseases are preventable, at least to a very considerable degree, provided the proper preventive measures can be applied at the proper time. In all parts of the world sanitarians are earnestly working at the problem of prevention, while physicians are as attentively engaged in curing human diseases. The paramount importance of the prevention of disease is everywhere recognized, and preventive medicine is destined to be the medical science of the future. New advances are continully being made, new conquests are yearly achieved and old foes to human life are made to succumb to the potent agencies of science. Quite recently, M. Pasteur, in France, has discovered a means for the prevention of an intensely fatal malady in sheep and cows, by inoculation, as for the prevention of small pox; and there is reason to hope that many communicable diseases which now constitute quite a proportion of the annual mortality may soon be controlled in a similar manner.

But aside from the advantages which may arise from the employment of special measures of prevention, every physician of experience as well as every sanitarian is well aware that still greater benefits may be derived from attention to general hygiene in the prevention of a large share of the ailments which annually swell the mortality lists; and it is fair to conclude that the lack of information on these subjects which generally prevails among the common people is a prolific cause of sickness and death and thus of pecuniary loss to the State.

Taking all these facts into consideration, it is in the highest degree probable that if the whole truth were told, preventable sickness might be justly charged with being an expense to the State of Michigan of not less than $10,000,000 annually. Estimating the loss in other States to be no greater in proportion to the population, we have an aggregate loss to the whole United States of not less than $300,000,000 annually, an amount which would pay the whole of our national debt in six years.

Appalling as these figures are, they are none too large to represent the pecuniary loss alone, and do not represent anything of the still greater loss entailed by the death each year of thousands of citizens who are needlessly torn from their friends, from society, from positions of honor and usefulness in the State by the ruthless hand of preventable disease.

In view of these facts, it is too painfully apparent to need special emphasis that the protection of its citizens from the ravages of preventable maladies is one of the most important economies to which the attention of a great State can be directed, and that no department of the public service is of greater consequence to the material interests of the State than that devoted to the public health.

The most effectual means cf combating diseases which are not the result of unavoidable causes is by the wide diffusion among the masses of the people of knowledge respecting the nature of preventable diseases and the best means of prevention, as well as the principles of general hygiene, by which all maladies may be in a great degree prevented.

REPORT ON PUBLIC HEALTH

SUBJECTS BEFORE THE AMERICAN SOCIAL SCIENCE ASSOCIATION AT ITS MEETING IN SARATOGA, NEW YORK, SEPT. 5-9, 1881.

BY HON. LE ROY PARKER, OF FLINT.

Gentlemen of the State Board of Health:

In accordance with a resolution of this Board, passed at the July meeting, requesting me to be present as a delegate of the Board at the annual meeting of the American Social Science Association, to be held at Saratoga Sept. 5, 6, 7, 8, and 9, I attended the meetings of the Association, and beg leave to submit the following report of that portion of the proceedings which had reference to public health questions.

The chairman of the department of health, Dr. Walter Channing, of Boston, at the opening of the session, presented an address in which he first referred to the able and effective manner in which his predecessor, Dr. D. F. Lincoln, of Boston, had performed the duties pertaining to his office, paying a particular compliment to that gentleman's labors in the furtherance of the suppression of quackery.

The department committee had chosen as the topics for discussion at the meeting, Insanity and the Care of Inebriates. He referred to the proceedings of the International Medical Congress, recently held in London, saying that the progress made very lately in medical science was of a character hardly to be realized by the public, public health not having as yet felt the influence of new methods and new discoveries; that medicine is becoming more of an exact science; the symptoms of disease better understood, and, this being so, the prevention of disease is becoming more possible day by day.

He quoted the opinion of Dr. Lockhart Robertson that the more careful collection of statistics in reference to insanity of late, and the greater pains taken to secure the best treatment for the insane, afforded a reasonable explanation of the apparent increase in the number afflicted with that disease.

Dr. Channing, in addition to his opening address, read a paper upon the care of insane criminals and inebriates. He claimed that as the insane generally retained those ideas of living which they had acquired while in health, and were still affected by such influences as had formerly moved them, particular attention should be paid to the social influences which are thrown around them when in an insane condition.

According to Gen. Walker, the actual number of insane in the country is far in excess of any estimates which have been made of them. The census shows 5,000 insane in Illinois in 1880 as compared with 1,625 in 1870. This large increase in number cannot be the result of an actual increase in the insane to that extent, but is largely due to the greater pains taken to secure every instance of known insanity for the purposes of the census.

The separation of the criminal insane from those not criminal and their separate treatment was advocated. Massachusetts and New Jersey both favored this plan, and New York has had for some years an asylum for criminal lunatics. It has been found that with proper treatment this class may oftentimes be rendered harmless. The writer suggested the examination, by a competent expert, of the mental condition of criminals. He also advocated some sort of treatment for those possessed of violent and ungovernable passions.

The care and reformation of inebriates was a question of great importance, and one concerning which far more might be done than has been yet accomplished. An inebriate should be taken and cared for, and restrained during the reformatory period as much as a lunatic.

A paper on the "Practice of Medicine by Women in the United States" by Dr. Emily Pope, of Boston, was next in order,—the scope of which was to show how extensively women practiced medicine in the United States; to what extent those studying and taking their degree continued in the profession; the amount of patronage bestowed upon them as evidenced by their professional incomes; the effect of their work upon their health; the proportion which marry and the effect of marriage upon their professional life. The writer had devoted much time and work to the collection of statistics from the women physicians of this country, bearing upon the various points before indicated. Out of 430 graduates with whom she communicated, from nearly all of whom she received reports, 390 were in active practice, 11 had not practiced at all, 29 had abandoned their practice after a time; of these 29, 12 retired from practice on account of marriage, 7 on account of their poor health, and 5 to take up some other work. At the time of their graduation, 75 per cent were unmarried, 19 per cent were married, and 6 were widows; 314 belonged to the regular school and 13 were homeopathists; 77 reported themselves as self-sustaining from the start, 34 in less than a year, 34 in two years, 14 in three years, and 10 in longer periods; 138 as yet fail to support themselves upon their professional incomes, these being mostly non-practitioners. The health of the graduates is generally good, but 4 out of 13 who mention their ill health, regard it as the result of their professional work. In 15 States women physicians are allowed to become members of medical societies. The conclusion of the paper was that many women were willing to devote themselves to the practice of medicine, that they were fairly successful, that their number was constantly increasing, and that they found ready employment.

A paper on "House Drainage" by Edward S. Philbrick, of Boston, which had been announced in the program, was not presented.

A paper by Dr. Mary Putnam Jacobi, of New York, entitled "Some Considerations on the Moral and on the Non-Asylum Treatment of Insanity," was read. The writer selected for discussion the question of the theoretically best treatment of those forms and stages of insanity which are recognized as curable, and yet which very frequently remain uncured.

The prevalent idea to-day is that the only proper treatment of insanity in any form is removal to an asylum; that this is in itself a mode of cure whose chances of success are great in proportion to the early stage of the disease at which it is instituted. Some statements against the principle of asylum treatment were quoted from various authorities. Dr. Mortimer Granville thought that it had few positive excellencies of its own, and of these scarcely one is remediable.

Professor Duncan said: "Lunatics are not more frequently cured than they used to be; the number of recoveries has not increased."

Professor Maudsley said: "I hold it to be an erroneous principle to house up a person in an asylum simply because he is mad. No one sane or insane should ever be entirely deprived of his liberty unless for his own protection or for the drotection of society."

The views of others were quoted in support of the opposite doctrine.

Ebing says "that the asylum is not rarely the most direct agent of cure," and Griesinger, "that removal to a *good* asylum is most urgently indicated in the greater number of cases." The last two persons quoted advocate individualized treatment.

The writer, after a careful and exhaustive discussion of the varying features and modifications of insanity in its different phases, advocates the special treatment of mental disorders, first, in the home by the patient's own physician, if competent, and, second, in small groups in isolated cottages where the peculiar temperament, disposition, and individual manner of each patient may be most carefully studied and treated with respect to that form of disease which is peculiar to the individual case. The writer lays particular stress upon the social surroundings of persons afflicted with incipient insanity, and urges such treatment of them as will most effectually turn their mind from those subjects upon which they are insane.

The meetings of the association were well attended and much interest manifested in the proceedings of the health department. One good feature of the proceedings this year was that the papers and discussions pertaining to the health department were had before the entire association and not in a section by itself, and the debate upon topics presented was participated in largely by men distinguished in other lines of work.

TO EXCLUDE CONTAGIOUS DISEASES FROM SCHOOLS.

REPORT OF COMMITTEE ON LEGISLATION IN THE INTERESTS OF PUBLIC HEALTH ON A PROPOSED BILL TO PREVENT PERSONS LIABLE TO CONVEY A CONTAGIOUS DISEASE FROM ATTENDING SCHOOL.

To the State Board of Health:—

Your committee on legislation in the interests of public health, to whom was referred a proposed bill "to authorize district boards and boards of education in Michigan, to exclude from school persons not properly vaccinated, and persons infected with, or living at houses where others are infected with small-pox, scarlet fever, or diphtheria," would respectfully report that there appears to be a necessity for such legislation in order that contagious diseases may more effectually be restricted and prevented. It is a well known fact that the congregating together of school children in large numbers, coming as they do from all kinds of homes, both clean and unclean, affords ample opportunity for the spread of the contagious diseases with which any child in a school district may be afflicted. It is especially desirable that these fruitful sources of contagion should be carefully guarded, and the possible evil which may flow from them be reduced to a minimum. Your committee would recommend the bill as one that should become a part of the public health laws of the State.

LE ROY PARKER,
Committee.

The proposed bill is as follows:—

A BILL to authorize district boards and boards of education in Michigan to exclude from school persons not properly vaccinated and persons infected with, or living at houses where others are infected with, small-pox, scarlet fever, or diphtheria.

SECTION 1. *The People of the State of Michigan enact,* That the district board, the board of trustees, the board of education, or the board of school inspectors, as the case may be, of any school district in Michigan, may in their discretion, after having given notice of their intention to do so, exclude from the schools under their charge all persons not properly vaccinated or who do not present a certificate from the health officer of the township, city, or village, or from some physician duly authorized by the board of health of the township, city, or village in which the school house may be situated to grant such certificate, stating that the person has within the last five years been vaccinated, or re-vaccinated with pure and fresh bovine vaccine virus, said exclusion to be in force only until the presentation of such certificate of vaccination or re-vaccination.

SEC. 2. Said district boards, boards of trustees, boards of education, or boards of school inspectors may also, at any time in their discretion, after due notice, require all teachers in their employ to present certificates that they have within the last five years been vaccinated or re-vaccinated with pure and fresh bovine vaccine virus, said certificates to be signed by the health officer, or by some physician duly authorized by the local board of health to grant such certificate, or by some other physician whose certificate the school board may deem satisfactory; and they may suspend from teaching any teacher not thus certified to have been properly vaccinated, until presentation by the teacher of such satisfactory certificate of vaccination; and no district board, board of trustees, board of education, board of school inspectors, or school district shall be liable for any wages or salary of any teacher for said period of suspension in order to secure proper vaccination of the teacher.

SEC. 3. Said district boards, boards of trustees, boards of education, or boards of school inspectors may at any time exclude from the schools in their charge any person known to have recently been exposed to or infected with the small-pox, scarlet fever, or diphtheria, or living at a house where there is any person infected with the small-pox, scarlet fever, or diphtheria, until the presentation of a certificate from the health officer, or from some physician duly authorized, by the board of health of the township, city, or village in which the school-house may be situated, to grant such certificate, stating that such person is free from liability to communicate the small-pox, scarlet fever, or diphtheria, as the case may be.

SANITARY SCIENCE EXAMINATIONS.

REGULATIONS FOR EXAMINATIONS IN SANITARY SCIENCE BY THE MICHIGAN STATE BOARD OF HEALTH.

1. An examination in Sanitary Science will be held annually at Lansing, beginning upon the second Tuesday in July.*

2. All applicants for examination will be required to exhibit their diplomas from some reputable medical college, or give satisfactory evidence of the possession of a good practical knowledge of the English language, and of the sciences of Chemistry, Anatomy, Physiology, Pathology, and Toxicology.

3. All applicants for examination shall present their names to be enrolled by the Secretary of the Board previously to the session of the Board of Examiners.

4. Each and every candidate for examination shall, before appearing at the examination, pay to the Secretary of the Board an examination fee of one dollar.

5. The examination fee of those applicants who do not receive the certificate of the Board will be returned to them.

6. Examinations will be written.

7. The standard of requirements will be such, that, so far as relates to sanitary science, a person sustaining the examination will be considered properly qualified to act as health officer of any township, city, or village in Michigan.

8. The State Board of Health will give a certificate to such persons as, on examination, are determined by a majority vote of the members of the Board, to be qualified in Sanitary Science, according to the standard established by the Board.

9. Candidates will be examined in the following subjects:

I. BIOLOGY.—Including the reciprocal relations of the vegetable and animal kingdoms in process of growth, maturity, and decay,—the direct and indirect influences on human health.

II. THE NATURE, CAUSATION, AND PREVENTION OF DISEASES.—Including:
  a. *Vital Statistics*,—methods of ascertaining the death-rates and sickness-rates from all causes, and from the different diseases, at different seasons of the year, among persons of each sex at the different ages in life;

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* Not on the Wednesday succeeding the second Tuesday in July, as first published.

b. *Meteorological Conditions Coincident with certain modes of Death or Sickness*;
c. *Unsanitary conditions of surroundings*, their relations to the causation and prevention of diseases and deaths;
d. *Occupations, Habits, and Physical and Mental Hygiene;*
e. *Life-Histories of the Germs of Disease*, such, for instance, as smallpox; also of common bacteria; facts concerning the destruction of contagia and of bacteria by heat, etc.;
f. *Incubation-Periods of Communicable Diseases*;
g. *Management of Outbreaks of the different Diseases.*

III. THE PHYSICAL SCIENCES.—In their relations to the principles of Construction of Buildings, Ventilation, Warming, Drainage, Sewerage, Water-Supply, and to general questions in Sanitary Science, including:
a. *Chemistry and Microscopy*, as regards the examination of Air, Water, and Food;
b. *Meteorology*, as regards general knowledge of climatic conditions, the reading of instruments, and the correction of observations;
c. *Topography and Geology*, as regards elevation above the ocean, and above surrounding country, the nature of the surface and of the underlying strata, the relations of such facts to the purity of the air and of the water-supply.

IV. SANITARY ENGINEERING, APPARATUS, AND APPLIANCES.—As regards Water-Supply, Sewerage, Disposal of Sewage, Excreta, and Garbage, House-Drainage, Drainage of Lands and of Building-sites, Ventilation, Heating, Cooking, Railroad and other modes of Travel, and Special Sources of Danger to Life and Health.

V. SANITARY INSPECTION.—Including:
a. *The Principles of Plumbing, House-Drainage, and other Sanitary Arrangements about Dwellings;*
b. *Seating, Lighting, Warming, Ventilating, and other Sanitary Arrangements of Schools and other Public Places*;
c. *Investigation of the Origin and Spread of Outbreaks or Epidemics of Diseases;*
d. *General Inspection of Cities, Villages, and Localities, with respect to Drainage, Sewerage, Ordinary and Other Nuisances.*

VI. SANITARY LAW.—National, State, and Local Health Laws and Ordinances, relating to the Isolation, Restriction, and Prevention of Cases of Communicable Diseases, Disinfection, Vaccination, Notices required from Physicians and Householders, Reports to Local Boards and to the State Board of Health, Laws respecting Vital Statistics, the Inspection and Care of Articles Dangerous to Life and Health, Inspection of Animals, and of Foods and Drinks, the Pollution of Streams, Ordinary Nuisances, Dangerous Trades, Slaughter-Houses, and Overflowed Lands.

QUESTIONS ASKED BY MEMBERS OF THE MICHIGAN STATE BOARD OF HEALTH, AT THE SANITARY-SCIENCE EXAMINATION, IN 1881.*

QUESTIONS ASKED BY HON. LEROY PARKER, COMMITTEE ON LEGISLATION IN THE INTERESTS OF PUBLIC HEALTH.

1. Enumerate the powers and duties of the State Board of Health.
2. Give a general outline of the powers and duties of the National Board of Health with reference to the isolation, restriction and prevention of cases of communicable disease.
3. In case of a slaughter-house which is conducted in a manner offensive to persons living near it, what remedy does the law provide against such a nuisance?
4. In case of garbage or filth upon the premises of any person, what provision is there in law for its removal?
5. State the difference between a public and a private nuisance.
6. How is the exercise of those trades and occupations which are offensive or dangerous to the public health regulated?
7. What provisions are there in the laws of this State for the prevention of the adulteration of food and drinks?
8. What are the provisions of law in this State respecting vaccination?
9. What are the duties of health physicians and clerks of local boards of health respecting reports to the State Board of Health?
10. What restraint does the law impose upon the introduction of cattle affected with contagious disease, into this State?

QUESTIONS ASKED BY ARTHUR HAZLEWOOD, M. D., COMMITTEE ON CLIMATE, ETC., IN ITS RELATIONS TO HEALTH, AND ON POISONS, EXPLOSIVES, ETC.

1. Give a description of the three simplest forms of life, including the mode of reproduction.
2. In putrefactive changes what products are inimical to human life, and why?
3. Describe the effects produced on the human system by the inhalation of a moderate excess of carbonic acid.
4. Explain the cause of poisoning induced by canned fruits and meats when used as food.
5. How is animal heat influenced by poisons, with explanation of change?
6. Give reasons for the difference in temperature between day and night in elevated situations inland.
7. Explain why the so-called "Fruit belt" of Michigan has such a favorable climate.
8. Give explanation and nature of change in climate experienced by journeying from the sea coast to points 1,000 miles inland.
9. Under what conditions may ordinary illuminating gas explode?
10, Under what conditions may kerosene explode?

QUESTIONS ASKED BY REV. D. C. JACOKES, D. D., COMMITTEE ON BUILDINGS, PUBLIC AND PRIVATE, INCLUDING VENTILATION, HEATING, ETC.

(None received for publication).

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* The time of the examination was postponed from the July until the October meeting of the Board, and occurred October 11, 1881.

QUESTIONS ASKED BY DR. H. F. LYSTER, COMMITTEE ON EPIDEMIC, ENDEMIC, AND CONTAGIOUS DISEASES, AND ON SEWERAGE AND DRAINAGE.

1. Mention the chief characteristics of epidemic diseases.
2. What theories are held at present regarding their origin and modes of extension?
3. What proceedings are advisable to be taken in places attacked or threatened by epidemic disease?
4. Describe the best methods of disinfecting patients, clothing, furniture, houses, railroad trains, and marine vessels.
5. What practical method might be advised to keep at a minimum in this country variola or small-pox, at the least expense to the public?
6. Submit some feasible plan, which the public might adopt, by which scarlatina and diphtheria could be limited in their spread.
7. What is contemplated by and the object of a sanitary survey of a district?
8. In the construction of a residence, what would you advise regarding the plan of and the construction of the sewerage?
9. How should the sewerage system of a city be constructed with reference to rainfall and ventilation?
10. Describe the several effects produced upon land by tile drains; and deduce from these the influence of tile draining upon animal life and health.

QUESTIONS ASKED BY JOHN H. KELLOGG, M. D., COMMITTEE ON DISPOSAL OF EXCRETA AND DECOMPOSING ORGANIC MATTER, AND ON OCCUPATIONS, RECREATIONS, AND HABITS IN THEIR RELATION TO THE PUBLIC HEALTH.

1. Mention some of the principal means through which decomposing organic matter may become a source of disease.
2. Name and describe the principal articles which may be used as disinfectants, and express an opinion respecting the special adaptability and relative value of each, with the best modes of application.
3. Mention such trades or manufactures dangerous to public health as are now carried on in this State, together with the best means of securing immunity from the dangers incurred, when it is possible to do this by use of proper precautions.
4. What are the effects of over-crowding, as often observed in large tenement-houses and in populous cities?
5. How much solid food is daily required for the maintenance in health of an adult engaged in active labor, and what proportion of carbonaceous and nitrogenous elements?
6. What morbid conditions are likely to result from the habitual use of an excess of nitrogenous food?
7. Mention as many as possible of the habits which you consider prejudicial to human health and longevity, giving reasons.
8. Name the various stimulants and narcotics habitually used in this country, and describe their injurious effects upon the human system.
9. Mention some of the injurious effects likely to arise from various popular forms of recreation, such as base ball playing, rowing, dancing, etc.
10. Give an estimate of the annual expense to the State or county occasioned by diseases of a preventable character occurring in the county in which you reside, or in some other, with the facts concerning which you may be acquainted.

QUESTIONS ASKED BY JOHN AVERY, M. D., COMMITTEE ON FOODS, DRINKS, AND WATER SUPPLY; AND ON THE RELATIONS OF SCHOOLS TO HEALTH.

1. What basis of truth, if any, is there in the popular belief that green or unripe fruits and vegetables are injurious to health?
2. Under what conditions, in health and in disease, would you prohibit the use of milk as an article of diet.
3. What basis of truth, if any, is there in the popular belief that milk makes a person bilious, and that it "feeds fevers?"
4. Describe, in general, the best method of seating a school-room.
5. What should be the relation of light to the seats?
6. What in your judgment would constitute a well ventilated school-room, and how is that best secured?
7. At what age should children commence attending school?
8. How many hours per day, as a rule, should children under twelve years of age be kept in a school-room?
9. What effect may defective seating and lighting of a school-room have upon the sight of pupils?
10. What effect may defective vision have upon the general health and temper of a child attending school?

QUESTIONS ASKED BY HENRY B. BAKER, M. D., COMMITTEE ON DEATH-RATE, ETC., AND ON DISEASES OF ANIMALS IN RELATION TO PUBLIC HEALTH.

1. The total number of inhabitants of a given area is, at the middle of the year, 10,000, and the total deaths during the year among those inhabitants is 170; state the death-rate by two common methods of statement.
2. State approximately, so far as appears from published vital statistics, the actual total death-rates, in years ordinarily free from epidemics, in five cities which you name, in this country or in other countries.
3. According to a "Life Table" published in the Vital Statistics of Michigan, and elsewhere, and based upon statistics of deaths in this State, and upon statistics of the inhabitants in Michigan, by the United States Census of 1870, about what was the annual death-rate in Michigan in 1870?
4. State the reasons why it is or is not proper to compare the actual death-rates in different cities, States, or countries directly, and taking no account of the ages and sexes of the inhabitants of each city, State, or country.
5. Separating deaths into groups by ages of decedents, those in each succeeding period of five years in a group,—in what quinquennial period of age is there the greatest number of deaths from diphtheria?
6. Within what quinquennial period of age do the next greatest number of deaths from diphtheria occur?
7. In what quinquennial period of age is the greatest number of deaths from scarlet fever?
8. In what quinquennial period of age is the greatest number of deaths in Michigan from typhoid fever?
9. In what quinquennial period of age is there the greatest number of persons living in Michigan?
10. Name two or more diseases known to occur among animals in Michigan, and which are dangerous to life of mankind.

AMERICAN PUBLIC HEALTH ASSOCIATION.

REPORT OF ATTENDANCE AT THE MEETING HELD AT NEW ORLEANS, LOUISIANA, DEC. 7-10, 1880.

BY HENRY B. BAKER, M. D., MEMBER OF THE ASSOCIATION.

To the President and Members of the Michigan State Board of Health:—

GENTLEMEN:—As your delegate to the meeting of the American Public Health Association at New Orleans, Louisiana, December 7–10, 1880, I respectfully make the following report:—

The attendance at the meeting was good, in point of numbers, and also in the ability of those present, the remark having been more than once heard that it was the finest looking body of men which the speaker had ever seen.

There was manifestly an earnest interest in the papers read and in the discussions; the papers and the discussions covered a wide range of subjects of interest to practical sanitarians, some being new contributions to sanitary science, while others presented new groupings of old facts, general conclusions, and considerations of public policy.

The Association was welcomed to the State by the Hon. Louis A. Wiltz, Governor of Louisiana, who made a very acceptable speech, and his honor, Mayor I. W. Patton, in a short speech welcomed the Association to the city of New Orleans. The several street car lines were free to members of the Association, whose badges also admitted them to several places of interest. On behalf of the State Medical Society and of the New Orleans Medical and Surgical Association, Dr. J. P. Davidson delivered an address of greeting.

The address of Dr. Billings, President of the Association, gave interesting statements relative to the objects of the Association, the present condition of public sanitation, some triumphs in the past, and present difficulties and discouragements. On one topic he said:—

> "The emergency of the sanitarian comes, in fact, just at the time when the public sees no danger and no necessity for doing anything."

In speaking of obstacles to be overcome, he said:—

> "In conversations with prominent health officials I find that their difficulties and troubles may be placed in two classes:—
>
> "The first are those connected with the fact that they cannot make a living by devoting themselves entirely to sanitary work, as they would like to do; that there is not sufficient demand for thoroughly educated scientific men as health officers to give such pay for their services as they

require, and that, therefore, they have to do other things, to practice medicine, etc. Another feature of this discouraging prospect is the uncertainty of tenure of office, owing to political changes, and it is this mainly which prevents young men of brains and education from taking up sanitary work as a permanent profession. This, however, is merely one branch of the vexed question of civil service reform, and I do not propose to discuss it. I will only say that no health officer in this country who is required, or ought to be required, to devote his whole time to sanitary study and work and who is qualified for his post, receives one-half the compensation which he could earn in other professional work. * * *

"The second class of discouragements which beset our sanitarians relate to the doubts and uncertainties connected with the subjects of their study. To some of these I have already referred, but I wish to allude more especially to the difficulty in learning whether a community is healthy or not—in other words, to the uncertainties of vital statistics. * * *

"The first thing to be done is to provide for a registration of deaths, which can best be secured by a law or ordinance to the effect that in every case the head of the family, or the householder, shall make a return of the death, and obtain a permit for burial or removal of the body, and that failure to do this shall be taken as evidence of suspicious circumstances connected with it sufficient to warrant the action of the coroner.

"The second thing to be done is to take an account of stock by making a sanitary survey of the place, and putting on record the condition of each set of premises. The health officer of a place should have in his possession a brief description, from a sanitary point of view, of every premises in a city, and a person proposing to buy or rent a dwelling-house ought to be able, on the payment of a proper fee, to obtain a certified copy of the sanitary history of the house he proposes to occupy, its connection with sewers, the number and causes of the deaths that have occurred in it, or in the square in which it is situated, etc., just as much as he is able to obtain a record of title. With a careful sanitary survey as a basis, it would not be difficult to keep up this record."

With reference to the address by President Billings, the advisory council appointed a committee which reported to the Association, and the Association adopted a preamble and resolutions as follows:—

WHEREAS, The statements by the president in his discourse clearly present the demands which sanitary science makes for a complete and reliable system of national registration of diseases and of the causes of death, and also show that such records and the sanitary surveys of places and premises are essential means of successful public-health improvement, these recommendations and also those relating to local sanitary associations are earnestly commended to the attention of all boards of health and to the people throughout the United States. With the design to promote these objects, the following resolutions are recómmended for adoption:—

Resolved, That the best interests of sanitary science and the public health service require that the the faithful registration of vital statistics, and especially the correct notation and registry of of causes of death, together with a public record of prevalent diseases, should be maintained throughout our country; also that wherever there are boards of health, such boards should require that the records of epidemics and other prevalent diseases, and of mortality shall be correctly made and registered, and call upon all State and local boards of health and upon other public authorities, the medical profession and all members of this association, to do whatever they can to promote such uniformity and thoroughness in the notation and registry of diseases and causes of mortality.

Resolved, That the American Public Health Association recognizes and earnestly commends the efforts of the National Board of Health to secure a practical basis of uniformity for the notation and nomenclature of diseases and causes of mortality, and again* urges upon all State and local boards of health and upon other public authorities, the medical profession, and all members of this association to do whatever they can to promote such uniformity and thoroughness; that we appoint a committee of three to have this subject under consideration for the purpose of reporting progress and plans relating thereto at the next annual meeting, and for co-operation with the National and State Boards of Health, and with the medical and statistical bodies that have this subject under consideration.

Resolved, That systematic sanitary surveys and inspection are essential aids to successful public health works and to the progress and application of sanitary science. Therefore this association would urge upon State and local authorities the importance of such sanitary surveys and the sanitary maps and records that pertain thereto, and also would recommend that the registry of prevalent diseases and of mortality be as frequently as practicable so co-ordinated therewith as to disclose the preventable causes which need to be removed.

I shall not attempt to detail all the papers, but will make abstracts of a few, and report some of the resolutions which were passed by the Association.

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* See Transactions, 1875 and 1877.

One of the first of these resolutions was presented by the committee on "a plan for the prevention of the spread of venereal diseases;" it followed a valuable report on that subject, and, as amended and adopted, read as follows:—

"*Resolved*, That the American Public Health Association earnestly recommends to the legislative bodies of this country the enactment of a law constituting it a criminal offense to knowingly communicate, directly or indirectly, or to be instrumental in communicating a contagious disease, such as small pox, scarlet fever or the venereal diseases, and giving to the said boards of health and to the state and municipal health officials under their control, the same power in the prevention, detection, suppression and gratuitous treatment of venereal affections, which they now possess in cases of small-pox or other contagious diseases."

The following day another resolution on the same subject was adopted, as follows:—

"*Resolved*, That the executive committee be instructed to communicate with the State and municipal boards of health throughout the country, and supply them with a copy of the report of the committee on prevention of venereal diseases, and request their co-operation in the attainment of the object of the resolution submitted and adopted by the association."

Dr. McCormack, of Ky., offered a third resolution on this subject, which after amendment was adopted as follows:—

"*Resolved*, That for the purpose of securing uniformity in legislation in the States of this Union for the prevention of venereal diseases, the committee for the prevention of venereal diseases be reconstituted and instructed to prepare drafts of a State law and of a municipal ordinance calculated to secure the desired results, and report at the next annual meeting of this association."

Two other resolutions, somewhat similar in some respects, but somewhat broader, were offered by Dr. Chancellor, of Maryland, and adopted as follows:

"*Resolved* by the American Public Health Association of America, That for the better protection of the public health, the Legislatures of the several States be and they are hereby invoked to enact measures imposing a severe penalty against any person who, while suffering from any dangerous, contagious or infectious disorder, willfully exposes himself without proper precautions against spreading the said disorder in any street, shop, public place or public conveyance, or who enters any public conveyance, without previously notifying the owner, conductor, or driver thereof, that he is so suffering; or any person who, being in charge of any one so suffering, shall wilfully and knowingly expose such sufferer, or any parent or guardian who shall wilfully and knowingly permit their child or children to attend any public school during the existence of such disease in the family; or any person who gives, lends, sells, transmits, or exposes without previous and thorough disinfection, any bedding, clothing, rags, or other things which have been exposed to infection from any such disorder; or any owner or driver of a public conveyance who shall not have immediately provided for the disinfection of such conveyance after it has to his knowledge conveyed any person suffering from a dangerous, contagious, or infectious disorder, or the body of any person who has died from such disease; or the owner of any house in which any person has been recently suffering from a contagious or infectious disease, knowingly lets it or any part of it without having previously disinfected it, and articles therein liable to retain infection, to the satisfaction of the constituted health authorities, where such authorities exist, or, in the absence of any such authorities, to the satisfaction, stated under certificate, of a legally qualified medical man; or any person who, showing for sale or rent any house or part of a house, shall make a false statement as to the existence of any contagious or infectious disease therein at the time or within the period of two months prior thereto.

"*Resolved*, That the executive committee of the National Board of Health be requested to have prepared a project of a law embodying the substance of the foregoing resolution, and that the president of this association be directed to transmit the same, together with a certified copy of the resolution, to the Governors of the several States, with an official request that they will, as soon as practicable, lay the matter in due form before the Legislatures of their respective States."

Dr. James H. Letcher, of Henderson, Ky., offered preambles and resolutions, which were amended and adopted as follows:—

"WHEREAS, There are annually occurring in our large centers of population, and frequently in the provincial districts, numbers of cases of sickness and death from small-pox; and

"WHEREAS, The only certain method of restricting and preventing this loathsome disease is by vaccination and revaccination; therefore be it

"*Resolved*, That the boards of health of the several States in the Union, or, where no State boards of health exist, the State medical societies, be requested to take the matter of restricting and preventing small-pox under immediate advisement, and direct the attention of all local boards of health to the importance of seeing that all persons in their respective districts are properly protected by vaccination."

As members of this Board know, I prepared a paper to present to the Association, on the subject of the "Relations of Schools to Diphtheria and to Similar Diseases." I read the paper, and exhibited the large diagram illustrating it, and distributed about 100 copies of each of four small diagrams which I thought added interest to the subject.

Dr. Hand, President of the Minnesota State Board of Health, presented resolutions which were adopted, as follows:—

"*Resolved*, That the contagiousness of diphtheria is now well established; that that disease should, in all cases, be treated with the same vigorous isolation and quarantine that is everywhere enforced against small-pox.

"*Resolved*, That as we know little or nothing of the origin of diphtheria, we will request the National Board of Health to continue its investigation of the causes of this disease."

Among the notable papers read, bearing on problems in social science, were:—One by Gen. John Eaton, Commissioner of Education, Washington, D. C., on "Sanitation and Education;" one by Prof. S. E. Chaillé, of New Orleans, on "Laws of Evolution and of Sanitary Science;" and one paper of this nature which I thought especially useful for practical application as a stimulant to increased action by States and governments, was by Hon. Erastus Brooks, of New York, on "What the State owes the People." I cannot quote much of his paper here, but give two sentences, as follows:—

"I place the subject of health as among the first, if not the very first, in the science of political economy. It is a question which belongs to the wealth of the nation and to the prosperity of the people."

With reference to his paper, I offered a resolution, which was adopted as follows:—

"*Resolved*, That 500 copies of the address before this association by Hon. Erastus Brooks, of New York, on "What the State Owes the People," be printed in pamphlet form, and copies be sent to the Governors of States, together with a communication, respectfully asking them to consider the propriety of calling the attention of the legislative bodies in their States to the importance of action in the directions indicated in the paper."

A considerable portion of the time of the Association was taken up by the discussion as to the nature of the fever which occurred in and near New Orleans during the summer of 1880, the National Board of Health having acted upon the belief that it was or might be yellow fever, and the State Board of Health and some local authorities having declared that it was not yellow fever. While those who had most to do with it were generally disposed to make the arguments simply those relative to diagnosis, the real question of importance seemed to be as to what was the proper action by a board of health under such circumstances. One speaker—Dr. Bruhns—intimated that the existence of the National Board of Health was threatened if it did not show why the fever did not spread notwithstanding isolation and disinfection were not practiced.

The following resolution, offered by myself, was adopted:—

"*Resolved*, That this association deems it important that in times of doubt, respecting the nature of an outbreak of a disease which has some of the characteristics of an epidemic disease, the National Board of Health and State and Local Boards of Health should give the benefit of the doubt to the side of safety to the people, of whose lives they are the sworn official guardians, and that in all such cases all boards of health should take such action as will be applicable for the restriction of the epidemic disease which it is reasonably suspected exists."

A resolution relative to a proposed National Museum of Hygiene was offered by Dr. McCormack, of Kentucky, and amended and adopted as follows:—

> "*Resolved*, That the executive and advisory committees be requested to take under consideration the advisability of establishing a national museum of hygiene, and to report at the next annual meeting of the association."

An interesting description of the Sanitary Association at Lynn, Mass., was given in a letter from Dr. J. G. Pinkham, of Lynn.

Resolutions on the subject of Local Sanitary Associations were offered by Dr. Elisha Harris, of New York, and adopted as follows:—

> "*Resolved*, That in the judgment of the American Public Health Association the example of the local sanitary association of the city of Lynn, Massachusetts, as presented in this meeting by Dr. Pinkham, of that city, and as known by the works and publications, commends itself for imitation in all cities and villages.
>
> "*Resolved*, That in view of the great practical importance of local sanitary associations in cities and villages, the American Public Health Association earnestly recommends that a well-organized local association to promote the interests of hygiene—domestic, personal, and public—should be maintained in all populous communities; and further, that such local organizations should be effectual promoters of sanitary knowledge and improvement, and the faithful support of local sanitary authorities."

The report is respectfully submitted.

HENRY B. BAKER.

LANSING, *January 11, 1881.*

RELATIVE TO SUGARS AND SYRUPS.

ANALYSES AND EXPLANATIONS OF ANALYSES BY PROF. S. P. SHARPLES, OF BOSTON, MASS.

The following letter is self-explanatory:

Henry B. Baker, M. D.:

DEAR SIR:—I have been on the hunt for a long while for some specimens of coffee sugar adulterated with starch sugar. I have never met with but one or two, and I should be very glad to have samples. I have never yet met with a satisfactory method of detecting this adulteration. All coffee sugars contain a considerable amount of gum and of invert sugar. This invert sugar reduces copper-solution. In the same way all specimens of sugar-house syrup or of molasses contain invert sugar. The average composition of a sugar-house syrup is about as follows:

	Per Cent.
Cane sugar	33.00
Invert sugar	35.00
Gum and organic matter	12.00
Water	16.00
Ash	4.00
Total	100.00

These ingredients may vary a little but the above is about the average of the pure sugar. I shall be very much obliged to you if you will take the trouble to express me some samples of the sugars as sold in your vicinity, and I should like also samples of the syrups—say 6 oz. of the syrups and half a pound of the sugars. I am very much interested in this sugar question, as I am making hundreds of analyses of sugar each year. In the last eighteen months we have examined 1,800 specimens of sugar. I think our refiners here are trying to do an honest business. I have never, with a single exception, caught any of them, and that man is out of the business. If you will take the trouble to send the samples, I will report to you without charge, and give you the method employed in testing.

Yours,

S. P. SHARPLES.

Boston, Mass., Oct. 13, 1880.

In accordance with this request samples of sugars and syrups were procured from the retail stores in Lansing, Mich., and forwarded to Prof. Sharples. His report of the analyses of these specimens is shown in the following tables:

ANALYSES of Samples of SYRUPS and Molasses, by Prof. S. P. Sharples, Boston, Mass.

No.	NAME OF SYRUP.	Dealer.	Polarization.	Polarization after Inversion.	Temperature. °C.	Cane Sugar. Per Cent.	Difference.	Reducing Power.	Moisture.	Ash.	Ca O.	SO_3.	Gum.
1	Best Syrup	A.	36.70	-12	24°	36.88	+.18	25.93	24.57	4.58	.49	.09	8.04
2	Porto Rico Mol....	A.	51.50	-12.80	23°	48.52	-2.98	13.24	30.50	1.46	.15	.13	6.28
3	Glucose Syrup.....	A.	138.00	+132	24°	6.61	-131.39	28.34	22.99	.73	.07	.04	......
4	Poorest Syrup....	B.	37.00	-15.2	24°	38.00	+1.00	21.84	26.75	4.28	.61	.14	9.23
5	Best Syrup	B.	62.50	-19.6	23°	61.93	-.57	1.99	32.62	.41	.08	None	3.05
6	Poorest Syrup.....	C.	28.00	-12	23°	30.18	+2.18	29.20	26.69	1.88	.34	.10	12.05
7	Pure Sugar Syrup	D.	56.80	-18.60	24°	57.11	+.31	8.75	27.79	.04	None	None	6.31
8	New Orleans Mol..	E.	41.00	-9	24°	38.00	-3.00	10.83	29.91	2.72	.37	.17	18.54
9	Porto Rico Mol.....	E.	34.50	....	......	......	....	......	......	......	......	......	......
10	Corn Sugar Syrup	D.	135.00	+129.	24°	4.54	-131.46	44.62	13.90	.49	Traces	.23	......
11	Best Syrup, 90c....	F.	36.40	-12	24°	36.63	+.23	28.27	16.45	3.81	.15	.006	14.84

ANALYSES of 10 Samples of SUGAR, by Prof. S. P. Sharples of Boston.*

No.	KIND OF SUGAR.	Dealer.	Polarization.	Polarization after Inversion.	Temperature. °C.	Cane Sugar. Per Cent.	Difference.	Reducing Power.
1	A Coffee..................	E.	99.90	-30.40	24°	98.69	-1.31	None.
2	A Coffee..................	C.	98.60	-29.00	24°	96.69	-1.91	1.01
3	Granulated..............	A.	99.80	-29.40	24°	97.86	-1.94	Traces.
4	A Coffee..................	A.	99.70	-29.20	23°	97.23	-2.47	.27
5	C..........................	A.	83.40	-26.80	22°	81.79	-1.61	7.93
6	A Standard..............	B.	99.80	-31.00	21°	97.92	-1.88	Traces.
7	A Coffee..................	D.	99.70	-30.00	23°	98.00	-1.70	Traces.
8	A..........................	F.	98.00	-28.60	23°	95.50	-2.50	1.40
9	A..........................	G.	99.70	-30.80	22°	98.10	-1.60	.18
10	C..........................	G.	94.90	-28.00	23°	92.80	-2.10	3.06
11	New Process	H.	86.00	6.00	26°	70.40	-15.60	23.98

*Sample 11 was a "new process" sugar, added by Prof. Sharples.

EXPLANATION OF THE HEADS OF COLUMNS IN THE TABLES OF ANALYSES OF SUGAR AND SYRUPS.

POLARIZATION.

When sugars are dissolved in water and the solution placed in the instrument known as the polariscope they cause a rotation of the plane of polarization. This rotation varies with each kind of sugar.

The instrument in common use is so graduated that when 26.048 grams of pure cane sugar are dissolved in water and the solution made up to

100 c. c. and placed in the tube of the instrument, which is 200 centimeters long, the instrument indicates 100 per cent of sugar.

To use this instrument 26.048 grams of the sugar or syrup are weighed out, the solution treated with a little basic acetate of lead and then made up to 100 c. c., this solution is filtered and placed in the tube of the instrument. The reading of the instrument gives at once the per cent of sugar in the solution, provided there is nothing but cane sugar present.

The figures given in the fourth column of the table are this reading of the instrument.

POLARIZATION AFTER INVERSION.

If the sugar solution is mixed with one-tenth of its volume of strong hydrochloric acid and is then heated to 70 °C. for a few minutes, the cane sugar is converted into two other sugars called respectively lævulose and dextrose; one of these turns the plane of polarization to the left, the other to the right. With these two sugars, when at the temperature of about 90° C., the instrument will read 0°, that is, they exactly balance each other; at lower temperatures they no longer balance but the lævulose predominates and the reading is below 0°. The lower the temperature the lower the reading; therefore in taking this reading it is necessary to observe the temperature. Therefore after giving the reading after inversion the temperature is given.

Glucose or starch sugar polarizes in the same direction as cane sugar, but it is not inverted by the action of acids, so if it is present in any marked amounts the reading will be, after treatment with acid, still to the right.

Tables have been constructed by which the percentage of cane sugar in a solution is found from the three factors, direct polarization, polarization after inversion, and the temperature. If the percentage, as given by these tables, agrees within two or three per cent with the direct polarization then the solution is free from starch sugar, or only contains a small amount of it. If, on the other side, the discrepancy is large we may be certain that starch sugar is present; therefore the eighth column of differences is given.

REDUCING POWER.

In the course of the manufacture of sugar and syrups from the sugar-cane more or less of the sugar is inverted or converted into the so-called fruit sugar. It has been found, however, that these invert sugars in this case nearly balance each other or change the results but little in the polariscope.

These fruit sugars, however, reduce a solution of tartrate of copper. All syrups contain a considerable portion of these sugars. A solution of these sugars will not crystallize, and they have the power of preventing the crystallization of cane sugar from its solutions.

Sugar-house syrups and molasses in general are simply solutions of cane sugar containing too much of these other sugars to render it profitable or even possible to extract the cane sugar. The amount of these sugars can readily be determined by precipitating them by means of a copper solution. The results of this precipitation are given in the column headed "Reducing Power."

MOISTURE.

This is obtained by drying the sugar or syrup at a temperature of 100° C. until it ceases to lose weight.

ASH.

This is obtained by burning a portion of the sugar in a platinum dish. Pure granulated sugar is free from ash, while sugar-house syrups may have as high as four or five per cent of ash. Refiners know of no method of eliminating ash from these various solutions, and therefore it accumulates in the syrup.

The column headed "CaO" and "SO," give respectively the amount of lime and sulphur trioxide [anhydrous sulphuric acid] in the syrup or sugar. A poorly settled glucose or starch sugar will contain a considerable amount of these, while its ash will but rarely exceed one per cent.

GUM.

After taking into account the cane sugar, invert sugar, ash, and moisture we still find that we have not accounted for all the substances present. The remainder consists of various substances that are extracted from the cane at the same time as the sugar, and which are classed under the general heading of gum.

AMOUNTS OF GLUCOSE PRESENT IN CANE SUGARS.

From the foregoing it will be seen that the reducing power of a sugar is no indication of adulteration, it is simply an indication of the amount of inversion that has taken place during the manufacture. The action in the polariscope is the only accurate test, and even that is sometimes misleading unless in skilled hands.

It is the aim of the refiner to leave as little cane sugar as possible in his syrups. By proper manipulation a solution of cane sugar can be converted entirely into fruit sugar; it will then reduce one-half more copper than a solution of ordinary starch syrup of the same strength, or rather of the same solid contents.

The fruit sugar, in ordinary commercial sugars, is produced at every stage of the operation of refining, and is the great enemy with which the refiner has to contend, as it prevents his obtaining the full amount of crystals from his syrups. Some of the causes of its production are the prolonged heating of the solutions. The use of the vacuum pan has to some extent remedied this. The presence of small quantities of vegetable acids in the syrups, the effect of which is remedied by the use of lime. The slow souring of the solutions has also the effect of inverting a portion of the sugar.

Sulphurous acid and sulphites are used to a considerable extent in bleaching low-grade molasses. Their use is shown by an increase in the amount of the sulphates present in the ash.

In conclusion, I know of no reason why a well-made starch syrup should not be as healthy an article of food as any cane product. I have examined starch sugars that were as pure as the best cane sugars, and starch syrups that were far superior in point of purity to the ordinary sugar-house syrups which are found in the market. All starch or starchy substances are converted into glucose in the stomach as the first step towards their digestion. Many of the most palatable confections now found in the market are made to considerable extent of these starch products, and if the sugar or syrup is properly refined I know of no reason why it should not be used.

As to the commercial fraud of selling starch sugars for cane, that is a point the health officer has but little to do with, and, furthermore, it is a point which he should carefully avoid, since interested parties will do their best to get him to commit himself against articles whose only demerit is that they are sold in competition with the article the complainant is selling.

Respectfully,

S. P. Sharples.

[The committee of the Michigan State Board of Health on Food, etc., is not prepared to say whether glucose is or is not injurious to health. The question is one on which there is as yet little if any evidence, and is still under investigation. But granting all that is claimed for it by its manufacturers, that it is a harmless product, we say let it be put upon the market under an honest name—its own, and not as an adulterant of more valuable sweets.—John Avery, Committee.]

ANALYSES OF GLUCOSE SUGAR AND SYRUP.

Samples of glucose or grape sugars and syrups were obtained in Detroit and sent to Prof. Sharples for analysis, with the following result:

CERTIFICATES OF ANALYSES.

The sample of grape sugar marked "Powdered," submitted to me for examination, contains:

Moisture	12.34
Grape sugar, etc.	86.91
Ash	.75
	100.00
Lime	0.060
Sulphuric anhydride (SO_3)	0.520
Before inversion polarized	69°
After " "	69°

The sample of grape sugar marked "Cake," submitted to me for examination, contains:

Moisture	12.44
Grape sugar, etc	86.87
Ash	.69
	100.00
Lime	0.060
Sulphuric anhydride	0.470
Polarized before inversion	71.5°
" after "	71.5°

The sample of grape sugar marked "Glucose Syrup," submitted to me for examination, contains:

Moisture	9.68
Grape sugar, etc.	89.81
Ash	.51
	100.00
Lime	0.020
Sulphuric anhydride (SO_3)	0.290
Polarization before inversion	138°
Polarization after inversion	136°

The sample of "Corn Syrup," submitted to me for examination, contains:

Moisture	14.18
Grape sugar, etc.	70.70
Cane sugar	14.37
Ash	.75
	100.00
Lime	.085
Sulphuric anhydride	.220
Polarization before inversion	113°
Polarization after inversion	102°

Corn syrup [glucose] with about two-fifths sugar-house syrup.

These sugars are not quite first class, have rather too much sulphates in them. I have not given the reduction-tests with these, as enough were given in the former tests to show its utter fallacy.

Respectfully,

S. P. SHARPLES.

Boston, Mass., July 29, 1881.

PURE CANE SUGAR.

In order to have some definite knowledge of the amount of glucose necessarily formed in cane sugar by the process of manufacturing, and the effect of the use of sulphurous acid, the following letter was addressed to Major Ames, a sugar producer in Louisiana. His reply to the letter is also given:

Major Frank M. Ames, Canton, Mass.:

DEAR SIR:—Knowing that you are interested in the production of sugar in the South, I write to you for information. In the course of manufacture what is the maximum per cent of glucose which can be formed legitimately in the otherwise pure cane sugar? Is sulphurous acid used in the bleaching of sugar or syrup, and is this use attended with formation of glucose, unless the process is carefully conducted?

* * * * * * * * * * * *

Very respectfully,

HENRY B. BAKER,
Secretary.

Lansing, Mich., April 28, 1881.

Major Ames's reply is as follows:

Henry B. Baker, M. D., Secretary State Board of Health:

DEAR SIR:—Your letter of April 28, 1881, came during my absence in Louisiana. I had no data from which to give you correct answers, and asked for the same at plantation.

We use sulphurous acid gas to bleach the cane juice as it comes from the mill. We wash the fumes of sulphur very carefully, constantly changing the water they pass through. We do not think there is much if any injury resulting from the bleaching process. Many planters have a notion that it does injure the juice to a certain extent. They do not know that it does or does not. Some one has said so and that is enough in the minds of many of them. Others say it does not injure it. In the tests on our plantation for grape sugar we have never found one per cent in our sugars. We do not suppose our sugar will be very different from that of other planters who take ordinary care in the manufacture of their goods.

When in Chicago, in May, we were shown several samples of sugar which we were told contained from five to fifteen per cent of grape sugar. These samples were Yellow C and poorer quality sugars from a refinery—none of them Louisiana sugars. We were told that parties purchased Louisiana sugars and mixed from 10 to 20 per cent grape sugar with them.

In 1879-80 we used a single three-roll cane mill, and in 1880-81 we used the second mill. We wet the bagasse with hot water as it left the first mill. The juice was taken as it came from each mill and polarized as well as tested by Baume [hydrometer].

I send you the result of each year. The juice from second mill, including the water used to saturate the bagasse, did not probably exceed 10 per cent, possibly not over 12 per cent. We measured all the water used but did not keep the juice separate, consequently do not know the per cent of juice from second mill. The two streams were united before they passed into the box where they were subjected to the sulphurous acid gas. If there were 9 parts and 1 part respectively the polariscope would show a loss of one-tenth of 1 per cent, while Baume showed no loss in 1880-81.

POLARISCOPE TESTS.

Crop of 1879-80.

Average of first sugar made	98.3
" " second sugar made	94.9
" " unsulphured juice	11.20
" " sulphured juice	10.87
" " sulphured Baume	8.2
" " unsulphered Baume	8.1

Crop of 1880-81.

Average of first sugars	99.1
" " second sugars	94.8
" " first mill juice	12.6
" " second mill juice	10.1
" " first and second mill sulphured juice	12.2
" " first mill juice Baume	8.3
" " second mill juice Baume	6.9
" " both mills sulphured	8.1

Cane of 1880-81 was richer by polariscope than that of 1879-80.

The Baume saccharometer used in 1879-80 was so finely graduated,—that is, a full degree was but one sixteenth of an inch,—that we cannot give very accurate readings. As taken, the sulphured juice was the best.

Yours truly,

F. M. AMES.

Canton, Mass., June 10, 1881.

"MAPLE SYRUP"—MADE OF GLUCOSE.

Since the above was written, a sample of merchandise sold as "Pure Michigan Maple Syrup," "put up" for J. M. Smith & Co., Chicago, in one-fourth, one-half, and one gallon tin cans, was submitted to Prof. Sharples for analysis. His report upon its composition is as follows:

DEAR SIR:—Your sample arrived this morning; it only took a few minutes to settle its true character. It is corn glucose adulterated with maple sugar or syrup. Its test was as follows:

Polarization before inversion	131.4
" after "	112.0
Difference	19.4
Temperature	25°

This corresponds to 14.74 per cent of cane sugar, or approximately the syrup contains one-sixth of cane sugar and five-sixths of glucose.

Maple sugar [unadulterated] consists almost wholly of cane sugar, containing only traces of other sugars.

The article is a fraud when sold as "Pure Michigan Maple Syrup."

Yours respectfully,

S. P. SHARPLES.

Boston, Mass., March 11, 1882.

ILLUMINATING OIL.

In accordance with a vote of the Board at its meeting on April 13, 1881, the Secretary addressed a communication to the Attorney General of the State, relative to the interpretation of the law requiring the inspection of illuminating oils. The communication was as follows:

Michigan State Board of Health,
Office of the Secretary,
Lansing, May 21, 1881.

Hon. J. J. Van Riper, Attorney General, Lansing, Mich.:

Dear Sir:—At the last meeting of this State Board, the Secretary was directed to obtain the opinion of the Attorney General of this State, on certain questions relative to the proper interpretation of the State laws for the inspection of illuminating oils. Complying with such instructions, I have the honor to ask your official opinion.

In explanation of reasons why the Board wants this information, it may be well to say that the law requires this Board to "have the general supervision of the interests of the health and life of the citizens of this State." When this Board began its work, the interests of life and safety of citizens were much endangered by the use of dangerous illuminating oils. It is now charged that under the present law, upon which the citizens rely for safety to life and property, it is the custom of inspectors to brand as approved and safe, oil which has not been tested. The main question, upon which this Board wishes your official opinion, is whether the alleged custom is or is not in strict compliance with the law. It is apparent that there may be danger from such a custom. The Board wishes to know whether in order to avoid that danger it is necessary to change the law, or only that the customs of inspectors be changed. In case the custom proves to be an entirely safe one, it is desirable to know if the law must be changed in accord with the custom.

Enclosed I send you a copy of the present law, Act No. 127, laws of 1879. It is accompanied by the act of the present session amending it slightly as regards fees, and also including oil used for heating purposes under that to be inspected. It is plain that the intention of the law was to provide for the "inspection" which I think was clearly intended to include the *testing of all oils branded* by the State and Deputy Inspectors as "approved"; section one of the act plainly says that it shall be the duty of the Inspector to "examine *and test the quality* of all oils offered for sale"; that in case the oil "*so tested* shall not meet the said requirements," the Inspector shall brand the oil rejected. From what is said in section 2 of the act it is plain that the "inspection" of oil was intended to include the *testing* of the oil, for it says: "It shall be the duty of the inspector * * * to promptly inspect all oils * * * and to reject for illuminating purposes all oils which will emit a combustible vapor at the temperature of 120 degrees of Fahrenheit's thermometer"; I know of no possible way to learn by "inspection" whether the oil will emit a combustible vapor at such a temperature, except by testing a sample of the oil.

In section 3 it is made the duty of every inspector "to keep a true and accurate record of all oils so *inspected* and branded," etc., and upon this record his compensation is made to depend, section 6 specifying that "the amount of such salary to be determined by the number of casks, barrels, and packages *actually* inspected."

Again in section 3, it is made a misdemeanor for any "manufacturer, vendor or dealer * * * to falsely brand the package, cask, or barrel containing" oil, or to "use packages, casks, or barrels having the inspector's brand thereon, without having the oil *inspected*." It being declared wrong under this law for manufacturers and others to use branded barrels "without having the oil inspected" adds force to the other portions of the same law which imply that the *inspector* is to *inspect* before he brands any oil.

It seems to be a common practice of oil inspectors in this State to inspect a few barrels in a large lot, say five or ten barrels in a carload of fifty barrels, and to brand the whole lot "approved," and to take pay for the actual inspection of every barrel. The defense of this custom I understand is that the inspector believes that all the oil has originally come from one tank; but often this defense of the custom will not accord with the actual facts, for this Board has information direct from a deputy inspector that he does not test every barrel in a carload even when he has found by actual tests as many as three different grades of oil in a single carload. Even in such cases he tests oil from a few barrels, and, in case no oil is found actually below the standard specified in the law, without further testing, he then brands the entire lot "approved."

This Board has received from citizens many complaints respecting this method, some with reference to the payment of the fees for inspection of oil which it is claimed is not "actually inspected" as the law intended,—but most of the complaints relating to the supposed danger to life from the branding of oil "approved" which has not been actually tested by the inspector and concerning the quality of which, therefore, he has no actual knowledge.

Will you have the kindness to state your opinion whether the present law requires the testing of every separate barrel, cask, or package of oil, all the contents of which have not under the direct observation of the state or deputy inspector who inspects the oil, been taken from a tank or other receptacle the contents of which he has himself actually tested as our State law requires.

In case your opinion is that the law requires the testing of all oil branded, will you please state what legal provision there is for securing this. Can complaint be made before a court? If so, under what section or provision of law?

If complaint is made direct to the Governor of the State, can the claim that the law is not faithfully executed be maintained, and removal from office effected, in case it is proved that oil is branded which has not been tested by the officer branding it?

Very respectfully,

HENRY B. BAKER,
Secretary.

To the foregoing letter the following reply was received:

STATE OF MICHIGAN,
ATTORNEY GENERAL'S OFFICE,
Lansing, May 24, 1881.

Henry B. Baker, Esq., Secretary of the State Board of Health:

DEAR SIR:—Yours of the 21st inst. is at hand requesting an opinion as to the duties of inspectors of oils, and in reply, would say that section 2 of Act No. 127, of the laws of 1879, provides, "that it *shall be the duty* of the inspector and his deputies, to provide themselves, at their own expense, with the necessary instruments and apparatus for testing the quality of illuminating oils, and when called upon, to *inspect* all oils hereinbefore mentioned, and to reject, for illuminating purposes, all oils which will emit a combustible vapor at 120 degrees," etc.

This section also provides that the quantity of oil used in *the test* should not be less than a half pint, and provides what oil tester shall be used.

This section it seems to me settles the whole question, and clearly requires the inspection of all oils by the instruments and apparatus provided for in the same section. They are required when so inspecting, to reject for illuminating purposes, all oils emitting a combustible vapor at 120 degrees.

They are required to furnish apparatus, to examine the oil and to reject if not up to the standard. How is it possible to know whether it is up to the standard without an *actual test?*

How is the inspector to reject it and show his reason therefor, unless it has been actually tested in the manner provided by law?

The word "inspection" contemplates such an examination of each barrel, package, or cask, as will enable the inspector to determine by *actual test* whether it will emit the combustible vapor at 120 degrees or not, for this is to determine the inspector's action with regard to it. The inspection of two or three barrels in a lot is only a compliance with the law as to that amount, and the remainder is taken upon a supposition that it is of the same quality. The law is equally imperative as to the remaining barrels. Section 2 of the same Act provides for the payment of certain inspection fees, and such fees cannot legally be collected unless such actual inspection is made of each barrel. The inspection of a half dozen barrels is not the inspection of a carload, and there is no warrant in the law for such a course.

The inspector's brand put upon a barrel, not inspected, but merely guessed at, would not protect the vendor if such oil was not within the test and he was aware of the fact that the inspector had not complied with the law, There must be an actual inspection of each package, cask or barrel by the instruments and in the manner provided by law.

Section 11, of the same Act, provides that the Governor may remove from office and appoint a competent person in the place of any inspector who is unfaithful in the duties of his office, and as the inspector may remove his deputies for the same cause the remedy is very plain.

Yours truly,

J. J. VAN RIPER,
Attorney General.

Upon the receipt of this opinion from the Attorney General, the following letter was addressed to the State Inspector of Illuminating Oils:

MICHIGAN STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
Lansing, May 25, 1881.

Hon. Cyrus G. Luce, State Inspector of Illuminating Oils, Gilead, Mich.:

DEAR SIR:—At the last meeting of the State Board of Health, several communications were presented stating that all the barrels or casks in a consignment of oil are sometimes branded by the inspector as approved for illuminating purposes when only part of them have been actually inspected by him; and the Secretary was directed to ask the opinion of the Attorney General as to whether such inspection of a part of the barrels of a lot of oil, and branding the whole, is a fulfillment of the law requiring an inspection to be made. A copy of the opinion given by the Attorney General in answer to this question, I enclose herewith,—conveying it to you first of all as the responsible head of the inspection-service of the State. This opinion is very plain that only on the actual testing of the contents of a cask, package, or barrel of oil can it legally be branded by the inspector as approved or as rejected; and I would be glad to have the opinion go to the Board and to the public with the assurance from the State Inspector of Illuminating Oils that his deputies have been instructed and will in future be required to inspect every cask, package, or barrel of oil offered or held for inspection, in accordance with the law.

An early reply will be thankfully received, and for this purpose I enclose a stamped envelope.

* * * * * * * * * *

Very respectfully,

HENRY B. BAKER,
Secretary.

To the foregoing letter, the following is that portion of the reply received which is of public interest:

OFFICE OF STATE INSPECTOR OF ILLUMINATING OILS,
Gilead, Branch Co., Mich., May 30, 1881.

Dr. Henry B. Baker, Secretary State Board of Health, Lansing, Mich.:

DEAR SIR.— * * * * * * * * *

The deputy oil inspectors are instructed to carefully test a sample of the oil contained in each barrel, cask, or package sold or offered for sale for illuminating purposes in the State, and when so tested to brand as the law requires.

It affords me pleasure to assure you that this has been so well done that kerosene oil has become about the most harmless thing in existence when used for its legitimate purpose. Lives are lost in almost every other way but not one by the use of this as an illuminator in the last two years.

* * * * * * * * * *

Yours truly,

CYRUS G. LUCE,
State Oil Inspector.

DISEASES IN MICHIGAN IN THE YEAR 1880.

A SUMMARY FOR THE STATE, COMPILED IN THE OFFICE OF THE SECRETARY OF THE STATE BOARD OF HEALTH FROM REPLIES* BY REGULAR CORRESPONDENTS OF THE BOARD.

Statistics become valuable when compiled for a sufficient number of years, or series of years, to eliminate minor errors and fallacies, and to establish principles in the study to which the statistics relate. With this idea, the study of diseases and antecedent and coincident meteorological and other conditions, by means of replies after the close of the year from selected correspondents has been carried on for each of the years 1875, 1876, 1877, 1878, 1879, and 1880. For 1880, Circular 40 was issued in January, 1881, and was similar to those issued before. New questions were inserted as bearing upon facts brought somewhat into prominence during the year. These new questions were,—20, relative to any connection between closing of the schools and the decrease of communicable disease; questions 42 and 43 relating to means of communicating scarlet fever and diphtheria. Question 22 was made to call especial attention to hog cholera, and 23, 24, and 25 were inserted relating to the prevalence in other animals, of the disease known as hog cholera; to sickness caused by the eating of pork from choleraic hogs, and as to the communication of the disease to man by inoculation or otherwise. The questions in the circular are printed, in small type on pages following, each question being followed by the summary of the replies to it, or by remarks concerning the replies. The summary and remarks are printed in larger type than that used for the question. Replies to the circular were received from 34 correspondents representing 33 localities. The replies for each locality represented are printed on pages following the summary. It is hoped that correspondents will make regular and frequent observations during the year so that replies to this circular in the future may more easily be made and may be more complete. Much credit is due to the correspondents who have replied to this circular for 1880, and from whose valuable replies this summary has been compiled. The circular and summary are as follows:—

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* The replies are printed in full immediately following the summary.

CIRCULAR TO CORRESPONDENTS, RELATIVE TO DISEASES IN MICHIGAN IN 1880.

[40.]

OFFICE OF THE STATE BOARD OF HEALTH,
LANSING, MICHIGAN, *January, 1881.*

To the Correspondents of the State Board of Health:

GENTLEMEN:—This Board desires to have, and to place upon record for purposes of future study and comparison in connection with records of deaths and of meteorological conditions, statements, for as many different localities in the State as possible, of the diseases in Michigan during the year 1880. Will you have the kindness to send, as soon as is convenient, and on this sheet, your replies to the following questions? So far as exact and generally accepted common terms can be used, it is desirable to avoid the use of technical terms. Please use the stamped envelope enclosed herewith, and leave all additional postage to be paid at this office. In replying, it is desired that you fill the blanks in this Circular; if the blank space is not sufficient for your answer, please refer to and use an extra sheet referring to the question by number.

1. If you live in a city or incorporated village, what was the number of inhabitants of said city or village by the census of 1880?
2. Among these inhabitants above mentioned, what do you estimate the number of deaths from all causes during the year 1880?

THE ESTIMATED DEATH-RATE IN MICHIGAN IN 1877-1880.

Questions 1 and 2 were asked with particular reference to cities and incorporated villages although several correspondents in country places made replies. Replies were received to question 1, giving a known or estimated population for 29 of the 33 localities represented. Replies were received to question 2, giving a known or estimated number of deaths from 28 of the 33 localities. Replies to both these questions were received from 6 cities, 18 villages, 1 township, and 1 prison. From these 26 localities having an estimated population of 210,176, there were reported 3,430 deaths, an annual death-rate of 16.32 in 1,000 inhabitants. The highest death-rate is reported from Brockway Center, being 25.00, and the lowest is reported from Otsego Lake, being 2.50. At the last-named place it is probable there are few inhabitants at the ages liable to greatest death-rate, namely, the youngest and oldest ages. The following table gives a comparative exhibit of the death-rates as reported for the years 1877–1880.

TABLE *Exhibiting the Estimated Population, the Estimated Number of Deaths, the Average, Highest, and Lowest Death-rates, and the Number of Localities in Michigan represented, by replies from Correspondents for the Years 1877, 1878, 1879, and 1880.*

	YEARS.			
	1877.	1878.	1879.	1880.
Number of localities represented	28	39	23	26
Total estimated population	218,980	285,867	202,329	210,176
Estimated number of deaths	3,393	3,749	3,272	3,430
Average deaths per 1,000 persons	15.50	13.10	16.17	16.32
Highest death-rate reported	40.00	25.00	33.33	25.00
Lowest death-rate reported	1.00	3.70	3.33	2.50

The replies by correspondents concerning the population and the number of deaths in 1880 are grouped in the following table which also gives the names of the localities, and states whether they are cities or villages, etc. As 1880 was the year of the United States census, it is probable that the estimated population is nearly accurate.

TABLE, *Exhibiting localities from which replies to Questions 1 and 2 were received, the Estimated population, the Number of Deaths reported, and the Average Deaths per 1,000 persons living, for each locality, for the Year 1880.*

DIVISIONS AND LOCALITIES.*	City, Village, or Township.	Estimated Population.	Deaths Reported.	Deaths per 1,000 Persons.
UPPER PENINSULAR DIVISION.*				
Delaware Mine	Twp. of Grant.	----------	8	
Escanaba	Village	3,500	50	14.29
NORTHERN DIVISION.*				
Otsego Lake	Twp.	399	1	2.50
Petoskey	Village	1,815	18	9.92
WESTERN DIVISION.*				
Grand Rapids	City	35,037	535	15.27
BAY AND EASTERN DIVISION.*				
Bay City	City	20,600		
Brockway Center	Village	400	10	25
CENTRAL DIVISION.*				
De Witt	Village	292	2	6.80
Flint	City	9,000	86	9.56
Gaines	Village	348	7	20.12
Hastings	City	2,540		
State House of Correction, Ionia	Prison	400	2	5
Muir	Village	800	6	7.50
St. Johns	Village	2,500	19	7.60
Webberville	Village	490	4	8.20
SOUTH-WESTERN DIVISION.*				
Niles	City	----------	67	
Otsego	Village	1,000	9	9
Pokagon	Twp.	2,000		
SOUTHERN-CENTRAL DIVISION.*				
Clinton	Village	1,000	8	8
Hillsdale	City	4,000	39	9.75
Hudson	Village	2,400	10	4.17
Manchester	Village	1,150	6–8	6.96
Mendon	Village	854	9	10.54
Tecumseh	Village	2,100	28	13.33

* For counties in each division, see Exhibit 1, page 257.

TABLE.—CONTINUED.

DIVISIONS AND LOCALITIES.*	City, Village, or Township.	Estimated Population.	Deaths Reported.	Deaths per 1,000 Persons.
SOUTHERN CENTRAL DIV.*—*Con.*				
Three Rivers	Village	2,525	32	12.67
Union City	Village	1,300	22	16.92
Vicksburgh	Village	800	17	21.25
Ypsilanti	City.			
SOUTH WESTERN DIVISION.*				
Detroit	City	129,000	2,400	18.60
Northville	Village	934	12	12.85
Pontiac (W. G. E.)	City	4,500	41	9.11
Pontiac (J. P. W.)	City	4,500	41	9.11
Wyandotte	City	3,632	55	15.14

* For counties in each division, see Exhibit 1, page 257.

3. Please state the territory for which your replies to the following questions are made?

The 34 replies to this question include 10 cities, and 16 incorporated villages, several townships, and 1 prison. The villages nearly all include a portion of the adjacent country. The territory represented is situated in 24 counties, and in 8 of the 11 geographical divisions of the State. A list of these divisions, and of the counties in each division, is printed on page 257.

SICKNESS IN 1880, COMPARED WITH PREVIOUS YEARS.

4. Among the people of your locality, considering the increase or decrease of population, was the amount of *sickness* from all causes during the year ending December 31, 1880, *greater less*, or about *the same as the average* during previous years? If not the same, how much was it increased or diminished?

To this question each of the 34 correspondents replied. Seven correspondents stated that they thought the sickness-rate had increased, seven, that it had decreased, and twenty that it was "the same," "about an average," or "about as usual." Of those who reported an increase, two said 50 per cent greater, one 33⅓ per cent greater, one 25 per cent greater, one 15 per cent greater, one said the sickness-rate was increased by 100 cases of diphtheria, and one simply said "increased." Of those who reported the sickness-rate decreased, one said 66 per cent less, one 25 per cent less, one a "small per cent less, three reported it as "less," and one said "not very much less." By comparing the replies to this question with those received for 1879, it is found that while 8 out of 28 reported the sickness increased in 1879, 7 out of 34 reported it increased in 1880. In 1879 nine reported it as being about the same, and in 1880 twenty made the same statement. In 1879 eleven thought the sickness-rate was decreased, while in 1880 seven thought it was decreased. In 1879 the average increase reported was 28.6 per cent; in 1880 it was 34.6 per cent. In 1879, the average decrease reported was 24.5 per cent; in 1880 it was 45.5 per cent.

It thus appears that an equal number (seven) reported the sickness increased and decreased in 1880, and that a majority of the correspondents reported the sickness about the same in 1880 as the average during previous years. If there was any change it would appear that the sickness was slightly reduced.

DEATH-RATE IN 1880 COMPARED WITH PREVIOUS YEARS.

5. Compared with previous years, and from all causes, was the ratio of *deaths* to inhabitants during the year 1880, *greater*, *less*, or about *the same as the average?* If not the same, how much was it increased or diminished?

Thirty-three correspondents replied to this question. Seventeen reported the ratio of deaths to inhabitants to be about the same as in previous years, eight stated it had increased, seven that it had decreased, and one said "not greater." Of those who stated that the ratio of deaths had increased, one said that it was 50 per cent greater; one, that it was 25 to 30 per cent greater; one, that it was "2 per 1,000" greater; two said "greater;" one said "3 more," and 2 reported a slight increase. Of the 7 who reported a decrease, one said that it was 50 per cent; one that it was 20 per cent; and one, that it was 10 per cent, the average decrease being 26.66 per cent. Four reported it as being less without stating the amount, one of them stating that it was a "little less."

It will be seen that about an equal number (8) reported the death-rate increased and decreased, and a little more than half the correspondents reported it about the same as the average of previous years.

DISEASES MORE THAN USUALLY PREVALENT IN 1880.

6. What diseases, or causes of death, were *more* prevalent in 1880, than usual in previous years?

Thirty-one correspondents replied to this question. Five replied that no disease was more prevalent in 1880 than in previous years. By the other 26 correspondents who replied to this question, the following diseases and causes of death were reported as more than usually prevalent during the year 1880:—

Diphtheria, by 6; scarlet fever, by 5; measles, by 3; influenza, cholera, infantum, and whooping cough, each by 2; bronchitis, consumption, membranous croup, diarrhea, remittent fever, typhoid fever, typho-malarial fever, pneumonia, small-pox, bilious fever, malarial fevers, mumps, entero-colitis, phthisis, "cancerous diseases," "congestive," old age, "malarial complications in other diseases," each by 1.

In 1879, 8 correspondents reported diphtheria as a disease of increased prevalence; in 1878, 15; in 1877, 6. In 1880, 5 correspondents reported scarlet fever as a disease of increased prevalence; in 1879, 2; in 1878, and in 1877, 6. A tabular view of abstracts from the replies to question 6 is given in Exhibit 2, on pages 258 and 259.

7. If you can assign any *cause* for the *unusual prevalence* of any disease, please do so.

Fourteen correspondents made replies to this question, a tabular view of which may be found in Exhibit 2, pages 258 and 259.

8. What diseases, or causes of death, were *less* prevalent in 1880, than usual in previous years?

Twenty-four correspondents made replies to this question. Of these, five reported no disease as having decreased in prevalence. Of the 19 who reported some disease or cause of death, of lessened prevalence,—malarial diseases were reported by 5; diphtheria, scarlet fever, measles, and typhoid fever were reported each by 3; pneumonia, by 2; bronchitis, cholera infantum, intermittent fever, remittent fever, "summer complaints of children," "fevers of various kinds," "inflammatory diseases," each by 1. A tabular abstract from the replies is given in Exhibit 2, pages 258 and 259.

9. To what do you attribute the lessened prevalence?

Fifteen replies were received to this question, from which abstracts are made in Exhibit 2, pages 258 and 259.

EXHIBIT 1.—*Eleven Geographical Divisions of the State, formed for the purpose of facilitating the Study of Causes of Sickness and of Deaths; with a List of Counties included in each Division.*

Upper Peninsular.	North-western.	Northern.	North-eastern.	Western.	Northern-Central.	Bay and Eastern.	Central.	South-Western.	Southern-Central.	South-eastern.
Baraga.	Benzie.	Antrim.	Alcona.	Kent.	Clare.	Bay.	Barry.	Allegan.	Branch.	Macomb.
Chippewa.	Gr. Traverse.	Charlevoix.	Alpena.	Lake.	Gladwin.	Huron.	Clinton.	Berrien.	Calhoun.	Monroe.
Delta.	Leelanaw.	Cheboygan.	Iosco.	Mason.	Isabella.	Lapeer.	Eaton.	Cass.	Hillsdale.	Oakland.
Houghton.	Manistee.	Crawford.	Montmorency.	Muskegon.	Mecosta.	Saginaw.	Genesee.	Van Buren.	Jackson.	Wayne.
Isle Royal.	Manitou.	Emmet.	Ogemaw.	Newaygo.	Midland.	Sanilac.	Gratiot.		Kalamazoo.	
Keweenaw.	Missaukee.	Kalkaska.	Oscoda.	Oceana.	Roscommon.	St. Clair.	Ingham.		Lenawee.	
Mackinac.	Wexford.	Otsego.	Presque Isle.	Osceola.		Tuscola.	Ionia.		St. Joseph.	
Marquette.				Ottawa.			Livingston.		Washtenaw.	
Menominee.							Montcalm.			
Ontonagon.							Shiawassee.			
Schoolcraft.										

The replies by correspondents are grouped by geographical divisions of the State, shown in this exhibit, and alphabetically by localities within the divisions. This exhibit is printed here in order to aid in turning to replies from particular localities, without referring to the index, and that reference may readily be made to it by page, from the exhibits which follow.

EXHIBIT 2.—*Indicating by Geographical Divisions of the State, and by Localities, the Diseases of Increased and of Lessened Prevalence in Michigan during the Year 1880, and the Supposed Causes of Increased and of Lessened Prevalence,—as Compiled from the Replies by 31 Correspondents to Questions 6, 7, 8, and 9, of Circular 40 from the State Board of Health.*

Divisions* and Localities.	Diseases of Increased Prevalence.	Supposed Causes of Increased Prevalence.	Diseases of Lessened Prevalence.	Supposed Causes of Lessened Prevalence.
All Localities.	See Summary of Replies to Question 6, page 256.		See Summary of Replies to Question 8, page 6.	
UPPER-PENINSULAR DIV.*				
Delaware Mine	Scarlet fever	Brought by Finn Immigrants.		
Escanaba	Typhoid fever, diphtheria, cholera infantum.	Defective sewerage causes poor drinking-water.	Remittent fever	Very little rain.
NORTHERN DIVISION.*				
Petoskey	Cholera infantum	Cannot	Cannot determine.	
WESTERN DIVISION.*				
Grand Rapids	Diphtheria		Cholera Infantum.	
BAY AND EASTERN DIV.*				
Bay City	Cancerous diseases	Cannot	Summer complaints of children	Early use of preventive remedies and general personal cleanliness.
Brockway Center	Diphtheria and scarlet fever	Cannot.		
Thornville	Influenza, whooping-cough and measles.		Malarial diseases	Improved drainage of land and residences.
CENTRAL DIVISION.*				
DeWitt	Whooping-cough	By schools before disease was recognized.	None in particular.	
Flint	Consumption, diphtheria, and scarlatina.	Coolness and humidity of atmosphere.	Various kinds of fevers	Better modes of living and improved sanitary conditions.
Gaines	Diphtheria	Funeral of diphtheria corpse in church.		
Hastings	None observed.			
Ionia,—State House of Correction	Diphtheria		Measles (16 cases in 1879).	
Muir	None		None.	
Webberville	None			General improvement of low lands; improved condition of inhabitants, etc.
SOUTH-WESTERN DIV.*				
Niles	Scarlet fever in Jan. and Feb.		Malarial	Evenness of temperature.
Otsego	Bilious fever	Unusually wet season.	Ague, diphtheria	Absence of epidemics of contagious diseases.
Pokagon	None		Diphtheria, scarlet fever, pneumonia.	Sanitary regulations.
SOUTHERN-CENTRAL DIV.*				
Clinton	Scarlet fever	Epidemic	Malarial diseases.	
Hillsdale	Measles	Measles imported	Miasmatic diseases	More even distribution of rain.
Hudson	Influenza, mumps, diarrhea, bronchitis.	Sudden changes of temperature except for mumps.	Typhoid fever	Do not know.
Manchester	Remitting fever and entero-colitis.	High temperature in May and stagnant water in swamps.	Inflammatory diseases, *e. g.*, pneumonia and bronchitis.	Mild winter, plenty of rain in winter months.

Mendon	Congestive	Cannot	None.	
Tecumseh	None		Scarlet fever, typhoid fever	Better sanitary conditions.
Three Rivers	Pneumonia	Frequent changes of temperature and damp, cold winds.	Malarial diseases	Drainage and not much breaking of virgin soil.
Union City	Measles	None assigned	None.	
Vicksburg	Old age and malaria complicating other diseases.	Malarial influence.		
Ypsilanti	Phthisis	Sudden and great cold	Typhoid fever	Better attention to strict cleanliness of the city.
SOUTH-EASTERN DIV.*				
Northville	Typho malarial		Diphtheria	Better sanitary measures.
Pontiac[1]	Small-pox	None	Measles	Lessened number of susceptible persons.
Pontiac[2]	Measles and malarial fevers	Members of Board of Health thought it best measles should prevail.	None.	
Wyandotte	Membranous Croup in fall		Scarlet fever and measles.	

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* For counties in each division see Exhibit 1, page 257.

[1] W. G. Elliott, M. D. [2] J. P. Wilson, M. D.

10. From what diseases or causes was there *more* than the usual *mortality* during the year 1880?

Twenty-five replies were received to this question. Eight stated that no disease caused more than the usual mortality. Of the remaining 17 who replied to the question, consumption was reported by 3; typhoid fever, pneumonia, scarlet fever, and small-pox, each by 2; cholera infantum, diphtheria, remittent fever (pernicious), cancerous affections, bilious fever, heart disease, croup, "congestive," and old age with chronic ailments, each by 1. An abstract from the replies to this question is given in Exhibit 3, on page 260.

11. If you can assign any *cause* for the *unusual mortality* from any disease, please do so.

Eight correspondents replied to this question. The replies are stated in Exhibit 3, on page 260.

12. From what disease or causes was there *less* than the usual *mortality?*

Twenty-two replies were received to this question. Eight stated that no disease caused less mortality than usual. Of the 14 others who replied to the question,—scarlet fever was reported by 4; malarial diseases, by 3; typhoid fever, pneumonia, and whooping cough, each by 2; bronchitis, cholera infantum, diphtheria, typho-malarial fever, measles, accidents, diarrheal diseases, lung diseases, and "fevers of all types," each by 1. A tabular view of the replies to this question is given in Exhibit 3, page 260.

13. To what do you attribute the lessened mortality.

Eleven replies to this question were received, and they are abstracted in Exhibit 3, page 260.

EXHIBIT 3.—*Indicating, by Localities in Michigan, the Diseases from which there was Increased Mortality, the Diseases from which there was Lessened Mortality, during the Year 1880, and the Supposed Causes of Increased and of Lessened Mortality,—as compiled from the Replies by 26 Correspondents to Questions 10, 11, 12, and 13, in Circular 40, from the State Board of Health.*

Divisions* and Localities.	Diseases of Increased Mortality.	Supposed Causes of Increased Mortality.	Diseases of Lessened Mortality.	Supposed Causes of Lessened Mortality.
All Localities.	See Summary of Replies to Question 10, page 259.		See Summary of Replies to Question 12, page 259.	
UPPER-PENINSULAR DIV.*				
Delaware Mine	Scarlet fever		Accidents with explosives	Expert handling of Hercules powder in mines.
Escanaba	Small-pox, typhoid fever, cholera infantum.	Overcrowded condition of village with poor drinking-water.	None.	
NORTHERN DIVISION.*				
Petoskey	Typhoid fever	Contamination of drinking-water.		
WESTERN DIVISION.*				
Grand Rapids			Scarlet fever and whooping-cough	Mild form of those diseases.
BAY AND EASTERN DIV.*				
Thornville	None		Typho-malarial fever and whooping-cough.	Mildness of typho-mal. fever and whooping-cough in warm, pleasant weather.
CENTRAL DIVISION.*				
De Witt	None		None.	
Flint	Consumption	Coolness and humidity of atmosphere.	Diarrheal diseases	Better modes of living and improved sanitary conditions.
Gaines	Diphtheria.			
Ionia,—House of Correction	Pneumonia and consumption each one death.			
Muir	Cancerous affections, 3 deaths		None.	
St. Johns	Consumption.			
Webberville	None.		Diphtheria, cholera-infantum, lung diseases.	
SOUTH-WESTERN DIV.*				
Niles	Scarlatina	Severity of the epidemic	Typhoid and malarial fevers.	
Otsego	Bilious Fever	Unusually wet season	None.	
Pokagon	None		Pneumonia	Mild winter.
SOUTHERN-CENTRAL DIV.*				
Clinton	None		Scarlatina	Mild type of disease.
Hillsdale	Old age with chronic ailments	No cause	Miasmatic diseases or fevers	Not particularly lessened.
Hudson	None		Fevers of all types	Lessened severity.
Manchester	Pernicious remitting fever in May and June.	High temperature, with stagnant water, produced malaria.	Pneumonitis and bronchitis	Moderate temperature in winter months.
Mendon	Congestive	Cannot	None.	
Tecumseh	None		Scarlet fever and typh. fever	Better sanitation.
Three Rivers	Pneumonia	Frequent changes of temperature, and extreme damp cold winds.	Malarial diseases	Drainage and less breaking of virgin soil.
Union City	Heart disease	Cannot	None.	
SOUTH-EASTERN DIV.*				
Northville	None		None.	
Pontiac†	Small-pox	None	None.	
Wyandotte	Croup		Scarlet fever and measles.	

* For list of counties in each division, see Exhibit 1, page 257.

† W. G. Elliott, M. D.

DISEASES ATTENDED WITH AN UNUSUALLY HIGH OR LOW RATE OF MORTALITY, WITH TIMES OF OCCURRENCE IN 1880.

14. Please give names, and mention dates of the occurrence in 1880, of any and all diseases attended with an *unusually high rate of mortality.*

In reply to this question 12 corrrespondents stated that no disease was attended with an unusually high rate of mortality. By the ten correspondents who named some disease of unusually high rate of mortality,—scarlet fever was reported in January and February, by 1, at time not stated by 1; cholera infantum June and July by 1, and in August by 2; typhoid fever in March by 1, and in July, August, September, November, and December by 1; diphtheria in November and December by 1; consumption in Autumn and first Winter months by 1, and at time not stated (1 death) by 1; pneumonia in January, February and March by 1, and at time not stated (1 death) by 1; cancer of stomach in February, by 1; cancer of breast in August, by 1; cancer of womb in September, by 1; malignant fever in February and September, by 1; congestion of lungs in April, by 1; congestion of brain in August, by 1; membranous croup in Fall months by 1.

15. Please give names, and mention dates of the occurrence in 1880, of any and all diseases attended with an *unusually low rate of mortality.*

Seventeen replies were received to this question. Eight stated that there was no disease attended with an unusually low rate of mortality in 1880. By the nine correspondents who mentioned some disease as being attended with an unusually low rate of mortality,—scarlet fever, in December, was reported by 1; whooping cough March to November, by 1; fevers and diarrheal affections by 1, time not stated; influenza, pneumonia, and tonsilitis in Winter months, by 1; malarial fevers July to October, by 1; typho-malarial fever July to October by 1; measles (2 deaths), time not stated, by 1; diphtheria, at time not stated, by 1. One correspondent stated that few died except old people and those broken down by chronic ailments.

16. Please give names, and mention dates of the occurrence in 1880, of any and all *diseases not usually occurring in your locality.*

Twenty-two replies were received to this question. Eight stated that no disease not usually prevalent in their localities was present in 1880. By the remaining correspondents who replied to this question,—scarlet fever was reported in Spring by 1, and time not stated by 1; cholera infantum in June, July, and August, by 1; diphtheria in March, by 1, in May by 1, in November and December, by 2; small-pox in January and February, by 1, in December, by 1; whooping-cough, Spring to Winter, by 1; mumps in Spring, by 1; typhoid fever, by 1, time not stated; opium habit, tabes mesenterica, cancer, hemorrhage of bowels, were each reported by 1, time not stated; spinal meningitis, by 1 in March, and by 1 time not stated; cerebro-spinal meningitis, by 1 in July; catarrhal and malarial diseases by 1, time not stated; intermittent fever in May by 1.

COMMUNICABLE DISEASES IN 1880.

17. State number of cases of each of the following diseases, and of any other epidemic, endemic, contagious, or infectious disease that appeared during 1880. (Facts are especially desired, but opinions are better than no statements, though it will be well to state them as opinions.) Small-pox, cholera, scarlet fever, typhoid fever, measles, whooping-cough, cerebro-spinal menengitis, diphtheria.

18. Of the eight diseases mentioned in question 17, *name those of which no case appeared* during the year 1880.

All of the correspondents replied to this question in whole or in part. One

EXHIBIT 4.—*Stating by Months the Number of Correspondents who Reported Cases of certain Diseases in reply to Circulars Relative to Diseases in Michigan in the Years 1877, 1878, 1879, and 1880*.—(See Question 21 of Circular 40, on page* 264, *and the paragraphs which follow it.)*

NUMBER OF CORRESPONDENTS WHO REPORTED THE OCCURRENCE OF THE DISEASES NAMED, IN THE YEARS STATED.

JANUARY.	1880.*	1879.*	1878.*	1877.*
Bronchitis	14	8	20	13
Rheumatism	11	9	15	7
Pneumonia	10	7	14	10
Influenza	10	6	13	8
Intermittent fever	8	9	15	3
Neuralgia	8	7	1	
Tonsilitis	7	7	2	
Consumption	6	8	13	7
Measles	5	1	2	1
Remittent fever	3	4	9	7
Typhoid fever	3	2	1	1
Whooping-cough	3	2	3	3
Diphtheria	2	6	11	9
Scarlet fever	2	5	8	3
Erysipelas	2	2	1	3
Typho-mal. fever	2	..	6	2
Diarrhea	1	2	4	2
Puerperal fever	..	1	3	1
Dyspepsia	..	..	3	
Sore throat	..	..	2	
Cerebro-spi. men.	1			
Catarrh	1			
Pleurisy	..	..	1	
Membranous croup	..	1	1	
Mumps	..	1	..	1

FEBRUARY.	1880.*	1879.*	1878.*	1877.*
Pneumonia	14	12	15	12
Bronchitis	13	11	22	12
Influenza	12	8	14	9
Rheumatism	9	9	14	7
Intermittent fever	9	8	15	5
Tonsilitis	7	6	2	
Consumption	6	7	13	5
Measles	6	1	2	2
Neuralgia	5	7	2	
Remittent fever	5	3	9	6
Diphtheria	3	4	7	8
Whooping-cough	3	1	3	2
Scarlet fever	2	3	9	3
Erysipelas	2	1	3	1
Typhoid fever	2	1	2	
Typho-mal. fever	2	..	3	1
Diarrhea	1	2	4	2
Dysentery	..	1	2	
Cholera morbus	..	1	2	
Croup	..	[a]1	2	
Pharyngitis	..	1	1	2
Dyspepsia	..	..	3	
Sore throat	..	..	2	
Cerebro-spi. men.	..	..	1	2
Catarrhal diseases	1			
Typhoid pneumo.	1			

MARCH.	1880.*	1879.*	1878.*	1877.*
Pneumonia	13	10	19	10
Bronchitis	12	11	19	12
Influenza	11	8	12	7
Rheumatism	10	12	16	8
Intermittent fever	9	9	19	8
Neuralgia	8	9	2	1
Consumption	7	6	16	7
Tonsilitis	6	7	2	
Whooping-cough	6	1	2	3
Measles	6	1	1	3
Remittent fever	2	5	12	5
Typhoid fever	2	1	2	1
Diphtheria	1	5	8	6
Scarlet fever	1	3	10	5
Erysipelas	1	2	1	2
Diarrhea	1	1	5	1
Typho-mal. fever	1	..	4	1
Mumps	..	2	2	2
Cholera	1			
Pharyngitis	..	..	2	1
Asthma	..	..	..	2
Dyspepsia	..	..	2	
Croup	..	[b]2	2	
Cerebro-spi. men.	..	1	[c]2	1

APRIL.	1880.*	1879.*	1878.*	1877.*
Bronchitis	14	9	21	10
Intermittent fever	13	11	26	11
Rheumatism	13	11	16	11
Pneumonia	11	4	14	8
Influenza	8	7	10	4
Consumption	7	9	13	8
Measles	7	..	1	2
Neuralgia	6	8	2	
Tonsilitis	6	6	2	1
Diphtheria	3	6	[c]5	3
Remittent fever	3	5	10	3
Whooping-cough	3	1	2	
Diarrhea	2	2	5	3
Erysipelas	2	1	6	4
Puerperal fever	..	2	2	2
Scarlet fever	1	5	8	5
Typho-mal. fever	1	1	4	
Typhoid fever	..	2	..	2
Mumps	..	2	..	2
Dysentery	..	1	1	2
Catarrhal diseases	..	1	..	1
Croup	..	[a]1	3	
Pharyngitis	..	..	3	1

MAY.	1880.*	1879.*	1878.*	1877.*
Intermittent fever	15	10	26	13
Bronchitis	8	7	15	8
Remittent fever	8	7	10	9
Neuralgia	8	7		
Consumption	7	8	15	8
Rheumatism	6	7	11	10
Pneumonia	6	4	9	8
Influenza	6	4	8	5
Whooping-cough	6	3	2	2
Measles	5	..	1	3
Tonsilitis	4	5		
Scarlet fever	4	4	4	5
Diarrhea	4	2	8	3
Diphtheria	3	5	4	6
Erysipelas	3	2	5	3
Malarial diseases	3			
Mumps	1	2	1	
Typhoid fever	1	1	2	1
Cerebro-spi. men.	1	..	1	
Puerperal fever	..	..	..	2
Dysentery	..	..	2	
Typho-mal. fever	..	..	2	1
Asthma	..	..	1	

JUNE.	1880.*	1879.*	1878.*	1877.*
Intermittent fever	17	11	24	14
Remittent fever	9	9	9	12
Neuralgia	9	5	1	
Rheumatism	8	7	13	7
Consumption	7	9	12	6
Bronchitis	7	7	11	5
Whooping-cough	7	1	5	3
Diarrhea	5	4	8	3
Measles	5	3	1	2
Influenza	4	3	10	4
Tonsilitis	2	4	1	
Pneumonia	2	3	8	6
Scarlet fever	2	3	6	4
Erysipelas	2	1	3	2
Typho-mal. fever	2	..	5	2
Cholera infantum	2	..	1	2
Inf. of bowels	2			
Malarial diseases	2			
Mumps	1	2		
Diphtheria	1	2	6	4
Cholera morbus	1	1	2	5
Typhoid fever	1	1	3	2
Dysentery	1	..	4	2

* Eighteen correspondents replied to this question in the circular for the year 1877; 32, for 1878; 16, for 1879; 26, for 1880.

For comments on this Exhibit, see paragraph 21, and the following paragraphs, on pages 264–5.

[a] Membranous croup. [b] Includes one membranous croup. [c] "Meningitis."

said "cannot give exact numbers;" one said in relation to scarlet fever, typhoid fever, measles, whooping cough and diphtheria, "cannot give numbers, none prevailed extensively." The summary of the other replies is as follows:

Small-pox.—Twenty-eight reported no case; 1 reported 10 cases, 2 reported 2 cases each and 1 reported 1 case, making a total of 15 cases.

EXHIBIT 4.—CONTINUED.—*Diseases in Michigan in 1880.*

NUMBER OF CORRESPONDENTS WHO REPORTED THE OCCURRENCE OF THE DISEASES NAMED, IN THE YEARS STATED.

JULY.	1880.*	1879.*	1878.*	1877.*	AUGUST.	1880.*	1879.*	1878.*	1877.*	SEPTEMBER.	1880.*	1879.*	1878.*	1877.*
Intermittent fever	17	11	25	13	Intermittent fever	17	13	27	14	Intermittent fever	16	12	24	16
Diarrhea	17	9	18	12	Diarrhea	17	11	25	11	Diarrhea	16	12	22	14
Remittent fever	13	8	16	10	Remittent fever	13	10	21	10	Remittent fever	13	10	20	10
Cholera morbus	8	4	6	8	Dysentery	12	5	12	12	Consumption	9	6	12	5
Dysentery	8	3	4	4	Cholera infantum	9	3	9	9	Dysentery	7	6	17	12
Consumption	7	7	13	6	Consumption	7	7	11	5	Neuralgia	6	5	1	
Cholera infantum	7	2	3	4	Cholera morbus	7	4	7	9	Rheumatism	5	5	10	6
Neuralgia	6	5			Neuralgia	6	4	1		Typho-mal. fever	5	2	10	5
Bronchitis	6	4	9	6	Typho-mal. fever	6	--	3	3	Whooping-cough	5	1	7	1
Whooping-cough	5	2	7	4	Whooping-cough	5	3	7	4	Cholera morbus	5	2	4	5
Rheumatism	4	7	9	5	Typhoid-fever	4	1	5	2	Typhoid fever	4	4	3	4
Erysipelas	3	3	3	2	Rheumatism	3	5	6	4	Diphtheria	3	6	7	3
Measles	3	1	--	2	Bronchitis	3	4	12	5	Cholera infantum	3	2	4	6
Diphtheria	2	5	5	4	Erysipelas	2	2	3	2	Pneumonia	3	2	4	1
Tonsilitis	2	5	1		Malarial diseases	2				Bronchitis	2	6	11	3
Pneumonia	2	1	5	2	Diphtheria	1	6	6	3	Tonsilitis	2	5	1	
Typhoid fever	2	1	1	1	Scarlet fever	1	4	2	4	Influenza	2	4	9	2
Typho-mal. fever	2	--	--	3	Influenza	1	4	4		Measles	1	2	1	
Malarial diseases	2				Tonsilitis	--	4	3	--	Scarlet fever	1	1	3	4
Scarlet fever	1	5	3	4	Pneumonia	1	3	5	1	Bilious fever	1			
Influenza	1	4	8	1	Measles	1	2	2		Malarial diseases	1	--	--	1
Sunstroke	--	1	2							Erysipelas	--	2	6	2
Eczema	--	1	2											
OCTOBER.					NOVEMBER.					DECEMBER.				
Intermittent fever	16	13	24	15	Intermittent fever	14	12	21	14	Bronchitis	14	8	22	9
Remittent fever	11	10	19	13	Rheumatism	10	8	12	11	Rheumatism	13	9	16	8
Diarrhea	10	10	12	9	Bronchitis	10	7	19	9	Influenza	12	6	18	4
Consumption	8	7	14	6	Influenza	9	4	11	4	Intermittent fever	11	11	14	14
Bronchitis	7	7	15	5	Consumption	8	7	16	7	Consumption	9	6	13	6
Rheumatism	7	7	10	5	Diphtheria	8	7	15	9	Diphtheria	8	9	17	9
Tonsilitis	7	6	4		Neuralgia	8	7	7	1	Neuralgia	8	7	6	
Neuralgia	7	5	3	1	Tonsilitis	6	7	5		Pneumonia	8	6	16	7
Typho-mal. fever	7	1	11	6	Remittent fever	6	6	14	12	Tonsilitis	7	4	8	
Influenza	6	3	12	6	Erysipelas	5	3	4	1	Erysipelas	5	1	5	
Diphtheria	5	8	12	6	Scarlet fever	5	2	6	5	Remittent fever	4	8	7	10
Typhoid fever	4	4	6	3	Pneumonia	4	5	11	3	Typhoid fever	4	1	2	2
Cholera morbus	4	2	2	1	Typhoid fever	3	3	4	4	Measles	3	5	2	
Whooping-cough	4	1	9	3	Diarrhea	3	3	8	7	Scarlet fever	3	3	6	5
Erysipelas	3	2	5	1	Whooping-cough	3	1	12	4	Whooping-cough	2	2	11	4
Scarlet fever	2	3	5	5	Measles	2	3	2		Croup	2	--	3	
Pneumonia	2	2	2	2	Malarial diseases	2				Typho-mal. fever	1	--	4	5
Malarial diseases	2				Typho-mal. fever	1	2	8	7	Diarrhea	--	4	2	1
Measles	1	2	1		Dysentery	1	1	3	3	Croup, memb.	--	1	3	
Dysentery	1	4	10	6	Pleurisy	1	--	1	2	Dysentery	--	1	2	2
Croup	--	[a]1	1		Croup	--	[c]3	2		Pharyngitis	--	1	2	1
Puerperal fever	--	--	2		Pharyngitis	--	1	2	1	Asthma	--	--	--	2
Cholera infantum	--	--	1	3	Liver, inflam. of	--	--	2						
Asthma	--	--	--	2	Cerebro-spi. men.	--	--	1						
Pharyngitis	--	--	--	2	Bowels, inflam. of.	--	2							

* Eighteen correspondents replied to this question in the circular for the year 1877; 32, for 1878; 16, for 1879; 26, for 1880.

For comments on this Exhibit, see paragraph 21, and the following paragraphs, on pages 264-5.

[a] Membranous croup. [b] Puerperal peritonitis. [c] Includes one membranous croup.

Cholera.—One case was reported, and 32 correspondents stated that no case occurred during the year.

Scarlet fever.—Thirteen correspondents reported that no case of this disease was present. Fourteen reported a total of 424 cases, ranging from 3 to 200 at one place; 2 reported a "few" cases.

Typhoid fever.—Fourteen correspondents reported no case present. Seventeen correspondents reported 229 cases, ranging from 1 to 75 cases in a locality.

Measles.—Twelve correspondents reported the disease as not present in 1880.

Sixteen correspondents reported 1,677 cases, ranging from 1 to 415 cases. One reported a "few."

Whooping-cough.—Twelve correspondents reported this disease as being absent in 1880. Sixteen reported a total of 957 cases, ranging from 1 to 400 cases in a locality. One reported "many cases."

Cerebro-spinal meningitis.—Twenty-five correspondents reported this disease as not present. Seven correspondents reported a total of 21 cases.

Diphtheria.—Nine correspondents reported diphtheria absent during the year. Eighteen reported a total of 1,177 cases ranging from 1 to 850 cases. One correspondent, who reported 8 cases of diphtheria, also reported 21 cases of ulcerated sore-throat. One correspondent from Keweenaw county, stated that in 12 years' practice he had never met a case of diphtheria in that county. One reported two cases, and one, one case of typho-malarial fever.

SPREAD OF DISEASES BY SCHOOLS.

19. Has attendance on the public schools in your neighborhood in 1880 spread any of the diseases mentioned in question 17? If so, what diseases?

Thirty-two correspondents replied to this question, 13 said no; 1 replied "am not certain," and 18 mentioned some disease which was spread. By these the following diseases were thought to have been spread by attendance on the public schools:—

Diphtheria, by 5; measles, by 10; scarlet fever, by 8; whooping-cough, by 6; mumps, by 1; typhoid fever, "probably," by 1.

20. Have you noticed any connection between the closing of schools and a decrease of communicable diseases in your vicinity? If so, what connection?

Twenty-nine replies were received to this question. Twenty-one said no. Three said yes. In five places the schools were not closed. Of those who said no, one said children having been sick with contagious diseases were not allowed to attend school within 4 to 6 weeks after recovery and a thorough disinfection of clothing. One said he thought children were more prone to mix and become exposed to contagium while estray than at school. One said children who had whooping-cough constantly attended school. Of those who answered yes, one stated that the schools were closed the last week in December and there was a falling off in sickness of 25 per cent. One said, when schools closed, diphtheria disappeared, when opened, it increased. One correspondent said, "In a compact community the only difference is that the epidemic sooner runs out by the agency of schools."

ORDER OF PREVALENCE OF DISEASES IN 1880.

21. For each of the months in 1880, please give a summary statement of the diseases which occurred, naming the diseases in each month in the order of their prevalence,—the disease of greatest prevalence first.

Twenty-six replies were received to this question, a tabular summary of which replies is shown in Exhibit 4, pages 262 and 263. This Exhibit also includes summaries of the replies to this same question by 16 correspondents for 1879, 32 for 1878, and 18 for 1877. In studying this Exhibit it will be necessary to bear in mind the number of correspondents who replied each year to the circular; these numbers are stated in a foot-note to the Exhibit. Additional statements respecting these diseases are given in the article on Weekly Reports of Diseases, printed on subsequent pages of this Report.

DISEASES WHICH CAUSED MOST SICKNESS IN 1880.

In Exhibit 4, pages 262 and 263 are given the diseases reported to be present in each month of the years 1877–1880, arranged in order in each month with reference to the number of observers by whom diseases were reported in 1880, the most prevalent disease in 1880, being first in each month. The figures in the columns under each year represent the number of observers who reported that disease present in that month in that year. In regard to neuralgia and tonsilitis it may be well to say that their apparent increased prevalence may be due in part to the fact that the attention of observers was first especially called to these diseases in October, 1878, when they were first printed on the postal-card blanks used for making weekly reports of diseases.

As in previous years, intermittent fever is shown to be the disease causing the most sickness, as it heads the list in seven months, is second in one month, fourth in one, and fifth in three months. Bronchitis heads the list in three months, is second in three, and third in one. Pneumonia heads the list in February and March. It will be noticed that diarrhea is second on the lists for July, August, and September; and in October it was but third in the list. By referring to the diagrams illustrating average temperature in the article on the Principal Meteorological Conditions in 1880, printed on subsequent pages of this Report, it will be seen that the highest average temperature of the year was in July, August, and September, while in October the average temperature was quite a little lower than in September.

DISEASES IN ANIMALS IN 1880.

22. During the year 1880, *what diseases* occurred, *at what time*, and *to what extent, among animals?* The term epizooty has been much used in this State relative to diseases among animals; as it does not designate a definite or distinct disease, please describe the character of any disease which may have occurred. Replies concerning the prevalence, character, and communicability of "hog-cholera," are especially desired.

Twenty-nine correspondents replied to this question. One reported "none," and one "nothing." and one "do not know of any." Regarding diseases among horses, replies were received as follows: A distemper in horses was reported by three, one stating in November, and December, and one saying it was catarrhal. Epizoöty in horses was reported by eight; in Autumn by one; in Summer by one, and in Fall by two; in November by one, and in December by two. One stated that it was catarrhal. Catarrhal diseases in horses were reported by three, one saying that it occurred in November and December. Pneumonia in horses was reported by two. "Inflammation of air-passages" and a "disease affecting the air-passages and lungs in March, April, and May," in horses, were each reported by one. One reported "a disease among horses," and one said that more horses died than in former years. Epizoöty was reported by three, and one reported catarrhal distemper in March and April, without mentioning what animals were affected.

Hog-cholera was reported by seven, one reporting it "unusually prevalent"; "hog-cholera in hogs and hens," by one; "in Fall," by one; in "August, September and October" by one; "nearly all the year, but worse in September, October and November," by one; in "November and December," by one; "chicken cholera in Summer and Fall," was reported by one.

One observer reported an obscure, fatal disease among sheep, destroying in some flocks twenty per cent.

23. Within your observation was the "hog-cholera" or a similar disease prevalent among other animals, as mice, rats, cats, dogs, hens, colts, etc., and man?

Twenty-five replies were received to this question. Twenty-one replied no; one replied yes, and one reported hog-cholera in hens, and one reported a disease among hens. One said, Hens suffered much; cats, rats, and mice were frequently found dead.

24. If you know of any injurious effect caused by eating the flesh, lard, or other product of hogs diseased with "*hog-cholera*," please state the facts.

Twenty-two replies were received to this question, twenty-one replying no, and one said "cholera morbus frequently followed the eating of fresh pork."

25. If you know of any case of communication of hog-cholera to man, by inoculation, or otherwise please state the facts.

Twenty-two correspondents replied to this question, twenty replying that they did not know of any case. One reported one case of sporadic diphtheria,—father stated that the boy played with a sick pig. One reported, "a boy aged 5 years ate a piece of raw Chicago cured ham, and was taken with vomiting the next day; fever immediately followed, and on the subsequent day, profuse herpetic-like vesiculæ appeared upon the face and neck, disappearing in 4 or 5 days."

DISEASES IN FRUITS, CEREALS, GRASSES, POTATOES, AND OTHER CROPS.

26. During the year 1880, what diseases, as rot, rust, smut, bunt, mildew, or mould, occurred among the crops, as potatoes, hops, fruits, and especially cereals and grasses?

Twenty-six correspondents replied to this question. Eighteen reported "none" or "none occurred," etc. One reported crops good. One reported "nothing marked." One reported "some insects." Diseases or unfavorable conditions in wheat were reported as follows: "Much was sprouted," by one; rust, by one; "mould," by two, one saying it was caused by wet weather in July. One reported mildew in grasses; mould in hay was reported by two; one said grass moulded, caused by wet weather in July. One said oats rusted. Rot in potatoes was reported by one; "apples and potatoes rotted" was reported by two.

27. As regards rye, oats, corn, buckwheat, and other grains raised in 1880, wheat in particular, what was the actual condition when ready for market or use?

Twenty-nine replies were received to this question. Nineteen reported crops good. One said corn left out until snow came was more or less moulded. One reported most of the wheat sprouted. One said crops were good excepting wheat which was badly grown, and made poor, sticky bread. One said wheat which was wet when threshed got mouldy; oats smutty, and often musty; crops secured damp quite generally. One said "poor from wet weather," and one who reported crops generally good, stated that more than the usual amount was injured by wet weather. One reported wheat damp, mouldy, and in poor condition for market, and one reported it damp and to some extent sprouted. Two reported oats "light," and one "fair." One reported buckwheat light and scarce. One reported corn soft and unripe. One reported rye "fair." One said "very damp," without saying what crops were affected.

28. Were any of these grains mentioned in question 27 affected by any kind of fungus?

Twenty-four replies were received to this question. Thirteen said "no." One said no, excepting corn, and one said, "very little in corn." One said, "corn more than usually affected by fungus." One said wheat moulded unless unusual care was bestowed. One said oats and wheat rusted in low grounds. One reported "only smut." Two said no more than usually appears, and one "none of any account," and one did not know.

EXHIBIT 5.—*Soil Moisture in Michigan by Months during the Year 1880, as Indicated by the Replies of 25 Correspondents to Questions 33, 34, and 35, of Circular 40 from the State Board of Health.*

Divisions* and Localities.	Soil Moisture by Months and without Reference to Previous Years. Months in Order of Dryness. Driest First.—(Question 33, page 270.)	Soil Unusually Dry. Time.—(Question 34, page 270.)	Soil Unusually Moist. Time.—(Question 35, page 270.)
All Localities.	†	‡	§
Upper-Peninsular Div.*			
Delaware Mine	Village on ground with rapid descent. No surface-water near. Water-supply, wells or springs in rock.	As usual	No.
Escanaba		July, Aug., and Sept.	
Northern Division.*			
Otsego Lake		Sept. and Oct.	April, May, and July.
Bay and Eastern.*			
Bay City	Had no general or long drouth.		
Brockway Center		Not very dry at any time.	July, Aug, and Sep.
Thornville	Jan., Feb., Mar., Oct., Nov., Dec., Apr., May, June, July, Aug.	Jan. and Feb.	August.
Central Division.*			
De Witt		Entire Spring, Summer, and Fall were extraordinarily wet. June the driest; July very wet.	July, latter part of Aug., Sep, unusually wet.
Flint	Rainfall generally distributed over Spring, Summer, and Autumn.	None were dry	Moist every month in the year.
Ionia	None		May, June.
Muir	No extremes during year.		
St. Johns			May, June, and July.
Webberville		None	January to July inclusive.
South-Western Div.*			
Niles	July, Mar., Sep., Oct., Jan., Feb., Nov., Dec., Apr., June, Aug., May.	Not unusually dry. driest in July.	Not unusually moist.
Otsego	A wet year. April, May, June, wettest.	No	All the year.
Pokagon		Aug. and Sep.	March and April.
Southern Central.*			
Clinton		None	June.
Hillsdale		None	April, May, June.
Hudson	Nov., Dec., May, July, Aug. No unusual moisture.	Nov., Dec.	None.
Mendon	Nov., Oct., Sep., Aug., July, June, Apr., Mar., May, Feb., Jan.	July and Aug.	Jan., Feb., May.
Tecumseh			No special change from previous years.
Union City	Aug., Sep., July, June, May, Oct., Nov., Dec., Jan., Feb., Mar., Apr.	None	Feb., Mar., Apr.
Vicksburg	Farmers kept from planting corn. In May, June more than usual.	Aug., Sep.	June.
Ypsilanti	July, Aug., Dec.	Dec.	August.
South-Eastern Div.*			
Pontiac (W. G. E.)	Season quite moist. July especially	Cannot say	July.
Pontiac (J. P. W.)	Cannot		Season as a whole was wet.

* For counties in each division, see Exhibit 1, page 257.

† These statements cannot well be summarized. Most of them name the months in order of dryness of soil, driest first. Fifteen correspondents made statements in reply to the question (33).

‡ Soil reported *unusually dry* at some time of the year 1880 by 9 correspondents, as follows: In Jan., by 1; in Feb., by 1; in July, by 3; in Aug., by 4; in Sep., by 4; in Oct., by 1; in Nov., by 1; in Dec., by 2.

§ Soil reported *unusually moist* at some time of the year 1880 by 17 correspondents, as follows: In Jan., by 1; in Feb., by 2; in March, by 3; in April, by 4; in May, by 5; in June, by 5; in July, by 6; in Aug., by 4; in Sep., by 2. From Jan. to July inclusive, by 1. All the year by 1. Unusually moist at no time, by 1. Whole season wet, by 1. Moist every month in year, by 1.

29. Was the wheat raised in 1880 generally allowed to get thoroughly dry before it was threshed?

In reply to this question fifteen correspondents said yes, and eight said no. One of those who said no, also said "much of it heated in the bin." Two said no wheat was raised in their vicinity.

EXHIBIT 6.—*Depth of Water in Wells, Depth of Earth above Ground Water, and Relative Height of Ground Water, in Michigan, by Months, during the Year 1880,—as Indicated by the Replies of 28 Correspondents to Questions 36, 37, 38, 39, and 40, of Circular 40, from the State Board of Health.*

Divisions* and Localities.	Average Depth of Water in Wells, by Months,—Question 36, page 270.	Usual Depth of Earth above Ground Water,—(Question 37, page 270.)	Depth of Earth above Ground Water, by Months,—(Question 38, page 270.)	Ground Water Unusually High. Time.—(Question 39, page 270.)	Ground Water Unusually Low. Time.—(Question 40, page 270)
All Localities.	†	‡	§	‖	¶
UPPER-PENINSULAR DIV.*					
Delaware Mine	Not more than 2 feet all the year.	Always have to go to stone and then excavate 1 to 30 feet.			
Escanaba	8 feet in each month in year.	6 to 20 feet	Water in wells varies with direction of wind. Is entirely surface-water.	In November water rose 4 feet and remained so several days.	
NORTHERN DIVISION.*					
Otsego Lake	3 feet in each month in year. Soil sandy, water in wells is from lakes.			No ground-water proper on account of sandy soil.	
Petoskey	But 2 or 3 wells in town.	From 40 to 17 feet	No appreciable difference.		
BAY AND EASTERN DIV.*					
Bay City		10 or 15 feet		Does not vary much.	
Brockway Center		15 feet.			
Thornville		20 to 100 feet	Jan., Feb., 18 ft.; March, 18 ft., 1 in.; April, 17 ft., 10 in; May 17 ft., 4 in.; June, 17 ft., 6 in.; July, Aug., 17 ft., 4 in.; Sep., 17 ft 2 in.; Oct., 17 ft., 7 in.; Nov., Dec., 17 ft., 5 in.	In none	Jan., Feb., March, and moderately low rest of year.
CENTRAL DIVISION.*					
De Witt		½ mile west of village, 10 ft.—in village 25 to 50. Sections 9, 10, 22, 23, 24, generally 40 to 50 ft.	Varies with locality from 2 ft. to 75 ft.	Entire Summer, Spring and Fall.	None.
Flint	Wells unusually full	Varies from 20 to 45 ft.		Spring, Summer and Autumn.	
Hastings		From 20 to 50 feet.			
Ionia,—State House of Correction	No well. Get water from spring.	From 5 ft. to 50 ft.		May and June	Aug. and Sep.
Muir	Jan., Feb., March, 3 ft.; Apr., 3½ ft; May, June, 3 ft.; July, 2½ ft., Aug., Sep., 2 ft.; Oct., Nov., 2½ ft.; Dec. 3 ft.	Varies from 10 ft. to 35 or 40 ft.	See 36.		
St. Johns	No average depth	5 to 15 ft., north of ridge, and 25 to 35 feet south of it.	Distance as given varies but a foot or two.	June, July, Aug., and Sep.	
Webberville				Jan., Feb., March, April, May, June, and July	None.

SOUTH-WESTERN DIV,*					
Niles	Cannot	Varies from 10 to 40 ft. In some localities it comes quite near the surface.	Cannot	At no time	At no time.
Otsego		Village, 18 ft.; north and west, 50 ft.; west, 80 ft.; south, 20 ft; east 20 ft.		All	None.
Pokagon		From 14 to 18 ft. on creek bottom, and in higher localities 30 to 50 ft.		March and April	September.
SOUTHERN-CENTRAL DIV.*					
Clinton		15 to 25 feet		None	None.
Hillsdale		16 to 80 feet	Jan., Feb., March, 12 ft; April, May, June, 10 ft.; July, 13 ft.; Aug., 15 ft.; Sep., Oct., 18 ft.; Nov. 16 ft.; Dec., 14 ft.	None	None.
Hudson	1 to 8 feet	2 to 30 feet	No records	Not unusually high	Nov. and Dec.
Mendon	Jan., Feb., 4 ft.; March, 3½ ft.; April, 3 ft.; May, 4 ft.; June 2½ ft.; July, 2 ft.; Aug., Sep., 1½ ft.; Oct., Nov., Dec. 1 foot.	17 feet	Jan., Feb, 16 ft.: March 16 feet, 6 in.: April, 17 ft.; May, 16 ft.; June, 17 ft. 6 in.; July, 18 ft.; Aug., Sep., 18 ft., 6 in.; Oct., Nov., Dec., 19 ft.	Jan., Feb., March, April	July and August.
Tecumseh	Does not vary materially.	16 to 20 feet	Does not vary more than a foot the whole year.	No special period	Little variation.
Three Rivers		20 to 25 feet.			
Union City	Jan., Feb., 9 ft.; March 10 ft.; April, 11 ft.; May, 8 ft; June, July, 7 ft.; Aug., 4 ft.; Sep., 6 ft.; Oct., Nov., 8 ft.; Dec. 9 ft.	40 feet. Along river valley 8 to 18 feet.	Jan., Feb., 31 ft.; March, 30 ft.; April, 29 ft.; May, 32 ft.; June, July, 33 ft.; Aug. 36 ft.; Sep. 34 ft.; Oct., Nov., 32 ft.; Dec. 31 ft.	Feb., March and April	None.
Vicksburg		12 to 15 feet	Rainfall does not greatly affect the wells.	January and May	
Ypsilanti		About 30 feet		August	December.
SOUTH-EASTERN DIV.*					
Pontiac,—W. G. E.	20 to 15 ft. in each month	10 to 60 or 90 feet	Variations too great to measure.	July	None.
Pontiac,—J. P. W.		8 to 60 feet		All the year.	

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* For counties in each division see Exhibit 1, page 257.

† In reply to question 36, 13 of the 28 correspondents who replied to this series of questions, made statements (not all of them, however, by months) concerning the average depth of water in wells in 1880. An abstract from the statements is given in the second column of the Exhibit. They cannot well be compiled.

‡ In answer to this question (37) 26 correspondents made statements concerning the usual average depth of earth above ground water in 1880.

§ In reply to this question (38), 4 correspondents made statements concerning the depth of earth above ground water, by months in 1880.

‖ Ground water reported **unusually high** at some time of the year 1880, by 14 correspondents, as follows: In January, by 3; in February, by 3; in March, by 4; in April, by 3; in May, by 3; in June, by 3; in July, by 3; in August, by 2; in September, by 1; in November, by 1; entire Spring, Summer, and Autumn, by 2; at no time, by 5; all the year by 2; "not unusually high," by 1; "no ground water," and "does not vary much," each by 1.

¶ Ground water was reported **unusually low** at some time of the year, 1880, by 6 correspondents as follows: In January, February, March, and July, each by 1; August, by 2; September, by 2; November, by 1; December, by 2; "little variation," by 1. Eight correspondents reported the ground water unusually low at no time.

30. Did a *greater*, a *less*, or the *usual proportion* of wheat raised in 1880, "bank," in the bin?

In reply to this question seven correspondents did not reply. Of those who did reply, three said none, four said greater, four said less, and three said the usual amount. One said, "if threshed early," and one said "very little binned." Two said none raised. Three said no, and three said yes, leaving the question unanswered.

31. Was the hay crop, secured in 1880, *more* or *less than usually* affected by mildew or mould?

Twenty-nine replies were received to this question. Three said not affected, seven said less affected, and six said more affected. Five said "no," and one said "yes." One said "not more;" two said crop was good. One said very little affected; one said, "in some localities," and one said "late hay was;" one did not know.

METEOROLOGICAL CONDITIONS IN 1880.

32. Please give a summary statement of the meteorological conditions during the year 1880, specifying, if possible, the general character for each month, and noting any peculiar or unusual conditions.

In reply to this question 26 correspondents made no statement. One said "generally cool and wet;" one said "nothing unusual occurred;" one said, "January, February, March, April and May, mild and wet; June, July, August, September, October, heat and moisture higher than average; November and December, cold and dry." Drs. Caulkins, of Thornville, Corbin, of St. Johns, Claflin, of Union City, and Elliott of Pontiac, give longer summaries which are printed with their replies in pages following. The principal meteorological conditions are more fully set forth in an article on that subject in subsequent pages of this Report.

SOIL MOISTURE, IN 1880.

33. Please state the facts concerning the *soil moisture* in your locality, during each of the months in the year 1880, *without reference to previous years*, but comparing the months in 1880 with each other. Group them in order—driest first.

34. *Compared with previous years* in what months of the year 1880 was the *soil* in your locality *unusually dry?*

35. *Compared with previous years* in what months of the year 1880 was the *soil* in your locality *unusually moist?*

An abstract from the replies and a summary to these questions is given in Exhibit 5, on page 267.

36. Please state the average depth of water in wells in your locality, in each month of the year 1880.

37. In your locality, what is the *usual average depth of earth above the ground water*, as indicated by distance down to water, from general surface of ground, in wells, streams, etc.? If different parts of your locality vary greatly, please answer for such different parts.

38. Without reference to previous years, please state the facts concerning the *depth of earth above the ground water* nearest the surface, in your locality, during each month of the year 1880, as indicated by the distance down to water in wells, streams, etc., or by other facts. How many feet and inches do you estimate it, in each month.

39. Compared with previous years, in what months of the year 1880 was the *ground water* in your locality *unusually high?*

40. Compared with previous years, in what months of the year 1880 was the *ground water* in your locality *unusually low?*

Twenty-eight correspondents replied to at least one of the above five questions. A tabular abstract and summary from their replies is given in Exhibit 6, on pages 268 and 269.

FACTS AND SUGGESTIONS RELATIVE TO THE CAUSATION, SPREAD, AND PREVENTION OF DISEASES.

41. Please communicate facts bearing upon, or cases illustrating the causation or communicability of diseases.

But four correspondents replied to this question. One reported one case of variola occurring in a 3-months-old child in a house where a case of mild varioloid existed 1 year ago; and one said scarlet fever has been communicated by clothing.

42. If scarlet fever occurred in your locality in the year 1880, please state the facts concerning the means by which it was communicated.

Twenty-one correspondents replied to this question. Six stated scarlet fever not present. Two reported that it was communicated by contagion. One that it was spread by schools. One that it was carried in clothing of pedlars and visitors from houses where there were cases; the disease did not attack any over 16 and few over 12 years old, even in families where by other cases they were constantly exposed. One reported that it was communicated by persons visiting patients conveying it in clothes. One reported "isolated cases confined to six families." One reported cause of first cases unknown, later cases by contagion. One reported sporadic cases, with no apparent contagious source. One said the disease was brought by a case from Iowa. One said the means of communicating the disease were not positively known. One said the disease died out in winter and spring. Two said they did not know, and one said he could not tell. One said the disease was communicated because there was an absence of isolation and disinfection.

43. If diphtheria occurred in your locality in the year 1880, please state the facts concerning the means by which it was communicated.

Twenty-three correspondents replied to this question. Eight replied that diphtheria did not occur in their locality in 1880. One said it was spread by contagion, and one by schools. One said the first case appeared in a crowded tenement house, where there were 19 persons in 6 rooms, and the disease was then carrried to school by other children in the same family. One observer said local insanitary conditions were prime factors in sustaining the disease, although cases from direct contact were not infrequent. One said there were cases in all parts of the town, although there were more cases in that part where the drainage was not good. One said the disease was brought by a convalescent, and it ran through two families causing one death in each. One said the disease seemed to be indigenous, as there were occasionally only sporadic cases occurring. The observer at the Ionia House of Correction said the disease was probably brought into that institution by a prisoner from Kalamazoo. One reported only sporadic cases, causes not known. Another said all appeared to be sporadic cases, except three which occurred in one family. One said he could trace it to no contagion or unhygienic condition. One said the disease originated in an old woman, who died. Three replied that they did not know.

44. Any suggestions which you may feel inclined to make, concerning methods which seem practicable, for the prevention of sickness or deaths, in your locality, or in this State, need not be withheld.

As stated after question 17, in the absence of positive knowledge, opinions are desired. The fact that it will be difficult, and sometimes impossible, to give the information asked for is well understood; the importance of the subject, however, warrants the request that each correspondent will take the care necessary to give definite replies to all the questions. The great value of a compilation of such replies must be conceded. Inasmuch as a similar circular will probably be issued for 1881, it would facilitate replying to that circular and add to the value of the replies, if correspondents would, during the year, make a record of facts concerning the prevalence of diseases, concerning meteorological conditions, and concerning soil moisture and ground water observed during the year. It is believed that in this way may be accumulated data which eventually will be of great value to the people.

By direction of the State Board of Health.

Very respectfully,

HENRY B. BAKER,
Secretary.

The following are replies to question 44.

W. W. MULLIKIN, M. D., of Escanaba, said:—

I do not think anything will make a radical change in the health of this village but a thorough cleaning up of all filth from the surface and in vaults throughout its limits.

W. R. MARSH, M. D., of Bay City, said:—

I would refer you to my report dated April, 1879, as yet applicable to the facts. I am sorry to say our town is neglected in regard to cleanliness. A few years since I was a member of the city council. I could get nothing done in regard to making any better regulation for securing health reports or a board of health. We are managed like a country village. We have no board of health. Our health officer is not a physician. We have a "pest-house." Aside from that this city has not a spot of earth where one dead or dying may be put aside for the resurrection day, except the county farm four miles away.

S. C. VAN ANTWERP, M. D., of Vicksburg, said:—

I think some of our sickness in this village during the last year might have been avoided if we could have had better sanitary regulations. Cases were reported to the marshal, but he would not act. If he had and the parties notified did not care to attend to his instructions, he would be obliged to have the work done or do it himself. Should the parties on whom notice had been served refuse to pay costs, he had no one to back him in his suit. And so he did not care to trouble himself about it. Unless the cause of diseases during the summer months especially can be removed by healthful sanitary regulations and enforced by law, we cannot expect much change for the better, only so far as citizens act for their own welfare by removing filth from cellars and about their premises.

For convenience of study and reference, the replies to the circular have been grouped by geographical divisions of the State, which divisions are shown in Exhibit 1, page 257. It should be remembered that the Board assumes no responsibility for opinions or theories expressed by those who reply to its circulars, but its correspondents have been selected with great care, and include many of the leading physicians in the State.

Respectfully submitted,

HENRY B. BAKER,
Secretary.

The replies to Circular 40 are as follows:—

UPPER-PENINSULAR DIVISION OF THE STATE.[*]

REPLIES BY T. D. BRADFIELD, M. D., OF DELAWARE MINE, KEWEENAW CO., MICH.

2.[†] Eight.

3. Township of Grant, Keweenaw county, a village without an organization as such. Delaware Mine and village of Wyoming.

4. About as usual.

5. Same as the average.

6. Scarlet fever.

7. Scarlet fever was prevalent, and was brought here by Finn immigrants.

10. Scarlet fever.

11. Scarlet fever caused four deaths, but as an offset there were less deaths from accidents.

12. Accidents with explosives.

13. High explosives, or Hercules powder (a form of nitro-glycerine), handled by experts causes fewer premature explosions.

14 and 16. Scarlet fever.

17. Scarlet fever, 33; typhoid fever, 1; measles, 1.

18. Small-pox, cholera, whooping-cough, cerebro spinal meningitis. Twelve years' practice here and have never heard of a case of diphtheria or met one in the county, and I have had experience with genuine cases in Grand Rapids.

19. None. I believe parents were to blame in seeing persons enter their houses direct from contact with the disease, and even visiting cases themselves.

20. None in the schools, and no children who had the disease were allowed to attend until 4 to 6 weeks after apparent recovery and after thorough disinfection of their clothes and homes.

21. *January, February, March, and April:* Principally pneumonia, bronchitis, erysipelas, and rheumatism.
May, June, July, and August: Erysipelas, diarrhea, continued fever of mild type.
September and October: Pneumonia, pleurisy.
November and December: Scarlet fever, pneumonia, bronchitis, pleurisy, rheumatism. Surgical injuries at all times with usual sequelæ.

22. Epizooty among horses, and is characterized by fever, lassitude, loss of appetite, with enlargement of glands of neck and discharge from nostrils. Duration six to twenty days.

23. No hog cholera.

26. None.

27. None raised in this county.

31. Not affected.

32. Did not live here but part of time, and kept no record during residence.

33. No surface-water near village, as it is on ground with rapid descent, and the source of water is wells or springs in rock.

34. As usual.

36. The same all the year. Not more than two feet.

37. Always have to go to stone and then excavate from one to thirty feet.

42. The contagium of scarlet fever was carried in clothes or on the person of peddlers, visitors, etc., going from houses in which disease existed. It did not attack any one over sixteen, and but few over twelve years; even members of families over these ages were exempt while constantly exposed.

43. Diphtheria never occurred in this locality.

Delaware Mine, Mich. T. D. BRADFIELD, M. D.

REPLIES BY W. W. MULLIKEN, M. D., OF ESCANABA, DELTA CO., MICH.

1.[†] Thirty-five hundred.

2. Fifty.

3. Village.

4. Increased fifty per cent.

5. Twenty-five or 30 per cent greater.

6. Typhoid fever, diphtheria, and cholera infantum.

7. Defective sewerage caused poor drinking-water.

8. Remittent fever.

9. Very little rain.

10. Small-pox, typhoid fever, and cholera infantum.

11. Overcrowded condition of village with poor drinking-water.

12. None.

14. Cholera infantum, June, July, August; typhoid fever, July, Aug., Sep., Nov., Dec.; diphtheria, Nov., Dec.

15. Scarlet fever in Dec.

16. Cholera infantum, June, July, Aug.; diphtheria, Nov., Dec.

17. Small-pox, 10; cholera, 1; scarlet fever, 15; typhoid fever, 75; measles, 415; whooping-cough, 10; cerebro-spinal meningitis, 3; diphtheria, 850. This is as accurate as we can count up, no record being kept.

18. Had them all.

19. Yes, diphtheria and measles.

20. Yes; the schools were closed the last week in December, and there was a falling off in the number sick of 25 per cent.

21. *January:* Bronchitis, pneumonia, meningitis.
February: Pneumonia, bronchitis, whooping-cough.
March: Whooping-cough, bronchitis, cholera.
April: Bronchitis, measles, meningitis.
May: Measles, meningitis, black measles.
June: Measles, cholera infantum, small-pox.
July: Small-pox, cholera infantum, typhoid fever, measles.
August: Typhoid fever, cholera infantum, small-pox.
September: Typhoid fever, cholera infantum, cholera morbus.
October: Measles, typhoid fever.
November: Typhoid fever, diphtheria, measles, lung fever.
December: Diphtheria, typhoid fever, measles. This is not absolutely correct, for there was no record of the diseases.

22. There was some disease among horses, but do not know how they were affected.

23. No.

24 and 25. Do not know of any.

26. Crops were good and uninjured.

27. I believe the grain crops were considered first class.

28. I think not.

29. Yes. There is but very little wheat raised here.

30. No.

31. Not at all.

33. Do not know.

34. July, August, and September.

35. Do not know.

36. Jan. 8 ft.; Feb. 8 ft.; March, 8 ft.; April, 8 ft.; May, 8 ft.; June, 8 ft.; July, 8 ft.; Aug. 8 ft.; Sept., 8 ft.; Oct., 8 ft.; Nov., 8 ft.; Dec., 8 ft.

37. Six to 20 feet; a bluff cuts across the western portion of the village about 20 feet high.

38. The water contained in wells is entirely surface-water and varies according to the direction of the wind. With the wind from the east the water rises in wells from one to three feet, and is as likely to be high and low again three or four times in any month. This village is situated on a sandy point projecting into Green Bay, and of course the water level is governed by the hight of the water in the bay.

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[*] For counties included in each division, see Exhibit 1, page 257.

[†] The figures beginning paragraphs refer to questions in Circular 40, printed (in small type) on pages 253-272 of this Report. A summary of the replies is printed on pages 253-272.

39. Once in November water in open wells rose 4 feet, and continued that way for 4 or 5 days.

42. They were isolated cases and the disease was confined to 6 families.

43. The first case occurred in a French family living in an old tenement house over water (19 persons in 6 rooms), and the disease was carried to school by other children in same family.

Escanaba, Mich. W. W. MULLIKEN, M. D.

NORTHERN DIVISION OF THE STATE.*

REPLIES BY N. R. GILBERT, M. D., OF OTSEGO LAKE, OTSEGO CO., MICH.

1.† Township; 339.

2. Only one.

3. Township of Otsego Lake.

4. About the same.

5. Less. Two deaths in 1879, one in 1880.

6. The one death mentioned was accidental.

14 and 17. None.

22. Do not know of any disease among animals.

25. This is a new county. Do not think there is a four-footed hog in the county.

27. What little there was raised was in a good, dry, and sound condition.

28. Think not.

29. Yes.

30. Very little if any binned.

31. No.

32. No record kept.

34. September and October.

35. April, May, and July.

36. Three feet in each month. The soil is very light and porous. All wells are sunk to a level of the small lakes abounding here,' and they scarcely rise or fall to be perceptible at any time of the year.

39. As before said, there is nothing that could properly be called ground-water, on account of the sandy soil.

42. No scarlet fever.

43. No diphtheria.

Otsego Lake, Mich. N. R. GILBERT, M. D.

REPLIES BY H. T. CALKINS, M. D., OF PETOSKEY, EMMET CO., MICH.

1.† Village; 1,815.

2. Eighteen.

3. Corporation of Petoskey.

4 and 5. About same as average.

6. Cholera infantum.

7. Cannot.

8. Cannot determine.

10. Typhoid fever.

11. Contamination of drinking-water.

14. Typhoid fever, March; cholera infantum, August.

17. Typhoid fever, 12; whooping-cough, 4.

18. Small-pox, cholera, scarlet fever, measles, cerebro-spinal meningitis, diphtheria.

19. No.

21. *February* and *March:* Typhoid fever.
July and *August:* Cholera infantum, dysentery.

22. None among animals.

23, 24, and 25. No.

26. Nothing marked.

27. Good order. Corn left out until snow came was more or less moulded.

28. No, except corn.

29. Yes.

30. None.

31. Less.

36. But two or three wells in town.

37. From 40 to 17 feet.

38. No appreciable difference.

Petoskey, Mich. H. T. CALKINS, M. D.

WESTERN DIVISION OF THE STATE.*

REPLIES BY ARTHUR HAZLEWOOD, M. D., OF GRAND RAPIDS, KENT CO., MICH.

1.† 32,037. To this should properly be added a suburban population of 3,000 more.

2. 485, with suburban population included, a total of 535.

3. City and one-half mile outside limits.

4. Twenty-five per cent greater.

5. Increased about 2 per 1,000.

6. Diphtheria.

8. Cholera infantum.

12. Scarlet fever and whooping-cough.

13. Mild form of those diseases.

16. In January and February each month one case of small-pox,—traced to a sleeping-car.

17. Impossible to give exact numbers.

18. Do not know of an authentic case of cholera.

19. Diphtheria was usually considered to have spread from this cause.

20. Data not sufficiently reliable.

21. *January:* Remittent fever, influenza, tonsilitis, diphtheria, measles.
February: Measles, remittent fever, influenza, tonsilitis, diphtheria.
March: Remittent fever, influenza, measles.
April: Remittent fever, influenza, neuralgia, bronchitis, measles, tonsilitis, diphtheria.
May: Remittent and intermittent fevers, influenza, neuralgia, bronchitis, chicken-pox.
June: Remittent and intermittent fevers, influenza, neuralgia, bronchitis, cholera infantum.
July: Diarrhea, remittent fever, cholera morbus, intermittent fever, cholera infantum, neuralgia.
August: Remittent and intermittent fevers, neuralgia, diphtheria, diarrhea.
September: Remittent and intermittent fevers, neuralgia, diphtheria, whooping-cough.
October: Remittent and intermittent fevers, influenza, tonsilitis, diphtheria, whooping cough.
November: Influenza, remittent and intermittent fever, diphtheria, whooping-cough,
December: Bronchitis, influenza, whooping-cough, diphtheria, scarlet fever.

32. *January:* Very mild; more or less rain.
February: Very mild.
March: Very mild; not much rain; no snow.
April: Variable temperature; and much rain.
May: Moderate temperature; rainy.
June: Variable temperature; rainy.
July: Variable temperature; some rain.
August: Hot, dry; last week atmosphere surcharged with vapor.
Sept.: Variable temperature; mostly dry.
October: Variable and chilly; some rain.
November: Cold, raw; snow.
December: Cold; snow.

43. My observations seemed to justify the opinion that unsanitary local surroundings were the prime factor in sustaining the disease, although cases from direct contact were not infrequent.

A. HAZLEWOOD, M. D.

Grand Rapids, Mich.

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* For counties included in each division, see Exhibit I, page 257.

† The figures beginning paragraphs refer to questions in Circular 40, printed (in small type) on pages 253-272 of this Report. A summary of the replies is printed on pages 253-272.

BAY AND EASTERN DIVISION OF THE STATE.*

REPLIES BY W. R. MARSH, M. D. OF BAY CITY, BAY COUNTY, MICH.

1. City. About 20,600.
2. Supervisor's report. I do not know.
3. The limits of the city.
4. About an average. We have had no epidemic.
6. From general observation I would say more cancerous cases.
7. Do not know.
8. Summer complaint of children.
9. More preventive remedies. Early and general personal cleanliness.

10-15. I cannot make a satisfactory answer to 10, 11, 12, 13, 14, and 15. Our town lacks all record on the question.

16. I know of no uncommon disease.
17. Scarlet fever, few; cerebro spinal meningitis, 10; diphtheria, about 100.
18. Small-pox, cholera, measles, whooping-cough. I do not know a real typhoid.
19. No.
20. No. I think practically that children are more prone to mix and become exposed to contagion when estray than at school.
22. Some horses have died. I think more than in former years.
24. Our food is good, and enough in quantity.
26. I am not acquainted with any farm interest.
31. Less.
33. We had no general or long drouth.
37. Ten or fifteen feet.
39. The water does not vary much during the year. We are all only 15 or 17 feet above the river.
42. I cannot. I know of nothing to cause what we have had that would not cause any other fever.
43. There were cases in all parts of the town, I think more in the south part where drainage is not as good.
44. I would refer you to my report dated April, 1879, as yet applicable to the facts. I am sorry to say our town is neglected in regard to cleanliness.

W. R. MARSH, M. D.

Bay City, April 18, 1881.

REPLIES BY A. MITCHELL, M. D., OF BROCKWAY CENTER, ST. CLAIR CO., MICH.

1. Unincorporated village. Population, 400.
2. Ten.
3. Townships of Brockway, Greenwood, Lynn, Speaker, Fremont, Maple Valley.
4. Same.
5. Fifty per cent greater.
6. Diphtheria and scarlet fever.
7. Cannot.
17. Scarlet fever, 200; typhoid fever, 20; measles, 200; whooping-cough, 100; diphtheria, 100; not positive about the exactness of these figures.
18. Small-pox, cholera.
19. Yes; scarlet fever and measles.
20. No.
21. *January:* Typhoid.
    - *February:* Typhoid pneumonia.
    - *March:* Pneumonia.
    - *April:* Pneumonia, whooping-cough.
    - *May:* Measles and scarlet fever.
    - *June, July, August, September, and October:* Scarlet fever.
    - *November* and *December:* Scarlet fever and diphtheria.

24 and 25. Do not.

27. Much of the wheat was sprouted.
29. No.
30. Yes.
31. More.
34. Not very dry at any time.
35. July, August, and September.
37. Fifteen feet.

42 and 43. By contagion.

A. MITCHELL, M. D.

Brockway Center, Mich.

REPLIES BY JOHN S. CAULKINS, M. D., OF THORNVILLE, LAPEER CO., MICH.

3. The township of Dryden, and parts of Lapeer, Metamora, and Attica townships.
4. About the same. The average was raised by an unusual prevalence of contagious diseases.
5. Certainly not greater.
6. Influenza and some zymotic diseases—principally whooping-cough and measles.
8. Malarious diseases.
9. Mainly to improved drainage of lands and residences.
10. None.
12. Typho malarial fever and whooping-cough.
13. It is believed that the lessened mortality is to be attributed in the case of typho-malarial fever to mildness of type; in the case of whooping-cough to the fact of its occurrence during warm pleasant weather.
14. There were none.
15. Whooping-cough, referred to above as attended with an unusual low rate of mortality, began in March and lasted till November.
16. There were none.
17. Scarlet fever, 12; typhoid fever, 10; measles, 50 (estimated); whooping-cough, 400 (estimated);
18. Small-pox, cholera, cerebro-spinal meningitis and diphtheria.
19. Yes. Measles.
20. Yes. There can be no doubt that the closing of the schools during the prevalence of epidemics of malignant, communicable diseases is a precautionary measure of primary importance.
21. *January and February:* Influenza, scarlet fever.
    - *March and April:* Influenza, whooping-cough, malarious diseases.
    - *May:* Influenza, malarious diseases, whooping-cough.
    - *June:* Influenza, malarious diseases, whooping-cough, measles.
    - *July:* Malarious diseases, whooping-cough, diarrhea.
    - *August:* Whooping-cough, malarious diseases, diarrhea.
    - *September:* Whooping-cough, diarrhea, malarious diseases.
    - *October, November, and December:* Whooping cough, influenza, malarious diseases.
22. No diseases prevailed among animals during the year except a "distemper" among horses in the months of November and December, and some obscure diseases among sheep. The horse-distemper was a catarrhal fever and not attended with any great mortality; the sheep disease, of the nature of which there was nothing learned, was sure death. It was not generally prevalent, but in a few flocks the loss was said to be as much as 20 per cent.
23. No.
26. None.
27. Wheat was badly grown, and made poor, sticky bread. The condition of other crops when ready for market, was good.

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* For counties included in each division, see Exhibit 1, page 257.

29.* No. Much of it heated in the bin.

30. A greater proportion.

31. No.

32. *January:* An exceptionally warm month for winter, some days having been warm enough for the last of April. Bees were out lively on the 27th, caterpillars were crawling about and ephemera swarming in the air. There was no sleighing and the month closed with no ice in the lakes and streams or ground.

February: Like January in the main, but with some wintry days and nights—no sleighing and the ice crop a total failure. Robins, bluebirds, and frogs, were seen by the 28th of the month.

March: A dry month, colder than January but warmer than a long average for March and less windy.

April: A wet month.

May: Very hot, no frost in the entire month, wheat in head by the 25th. Hot enough for June, with sufficient rainfall.

June: Very hot, several degrees above a long average with sufficient rainfall.

July: Hot with heavy rainfall, mostly from thunder storms, very little cloudy weather.

August: A wet, cloudy month—the soil much of the time too wet to plough.

September: Rather dry and not oppressively hot—slight frosts on the 15th, 22d, 23d, and 30th.

October: Much cloudy weather—16 frosty nights.

November: A very cold month, froze every night, and after the 10th every day.

December: An unusually severe winter month, with no thawing days, continuously cloudy weather, but no snow.

SUMMARY, for the Year 1880, of Certain Meteorological Conditions at Thornville Lapeer Co., Michigan,—Latitude 42° 55′ N.; Longitude 83° 10′ W.

YEAR AND MONTHS, 1880.	TEMPERATURE,—DEGREES FAHRENHEIT.				HUMIDITY OF ATMOSPHERE.[b]		Ozone, Average of Day and Night Observations.	Prevailing Winds.[e]	SUNSHINE.			Per Cent of Cloudiness.[b]	Rain and Melted Snow,—Inches.
	EXTREMES.[a]		Range.	Average.	Relative.[c]	Absolute.[d]			Per Ct. from Sunrise to Sunset.	Days all Clear (nearly.)	Days all Cloudy (nearly.)		
	Highest.	Lowest.											
YEAR	92	-12	104	48.76	80.4	3.92	3.32	N. W. ^{7} S. W. ^{5} S. E. ^{1}	52	157	131	55	39.00
Jan.	61 ^{11}	15 ^{29}	46	35.85	89	2.49	2.55	S. E. S. W.	34	8	13	64	2.55
Feb.	64 ^{28}	2 ^{6}	62	31.10	87	2.12	4.48	S. W.	49	12	13	63	1.46
March	57 ^{31}	10 ^{8}	47	32.94	81	2.07	4.55	N. W.	58	15	11	53	1.58
April	77 ^{14}	21 ^{11}	56	47.33	74	3.17	4.25	N. W.	41	9	13	57	5.74
May	90 $^{7, 25}$	32 ^{1}	58	67.12	70	5.51	3.79	S. W.	68	22	4	41	4.05
June	91 $^{24, 26}$	48 ^{8}	43	70.47	74	6.30	3.35	S. W.	83	15	8	44	3.12
July	92 $^{9, 13}$	51 ^{3}	41	71.73	75	6.64	3.00	N. W.	69	12	3	46	6.86
Aug.	90 ^{27}	46 $^{4, 16}$	44	69.61	79	6.47	2.31	N. W.	57	14	12	48	6.08
Sept.	90 ^{1}	37 ^{30}	53	61.22	78	5.22	2.19	N. W.	63	17	9	41	2.24
Oct.	75 $^{10, 11}$	28 ^{19}	47	47.77	80	3.44	2.92	N. W.	46	15	16	53	2.36
Nov.	61 ^{5}	-2 ^{22}	63	28.45	86	2.01	2.92	N. W.	35	16	6	62	2.29
Dec.	48 ^{5}	-12 ^{29}	60	21.53	92	1.63	3.55	S. W.	18	2	23	84	.67

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* The figures beginning paragraphs refer to questions in circular 40, printed (in small type) on pages 253-272 of this Report. A summary of the replies is printed on pages 253-272.

[a] By registering thermometers. The small figures above and at the right of the numbers stating the highest or the lowest temperature denote the day of the month on which the highest or the lowest temperature occurred. [b] Average of observations, at 7 A. M., 2 P. M., and 9 P. M., daily. [c] Average per cent of saturation. [d] Average grains of vapor in a cubic foot of air. [e] By 3 daily observations.

33. January, February, March, October, November, December, April, May, June, July, August.
34. January and February.
35. August.
37. From 20 to 100 feet.
38. Measurements in well 20 feet deep: January, 18 feet; February, 18 feet; March, 18 feet, 1 inch; April, 17 feet, 10 inches; May, 17 feet, 4 inches; June, 17 feet, 6 inches; July, 17 feet, 4 inches; August, 17 feet, 4 inches; September, 17 feet, 2 inches; October, 17 feet, 7 inches; November, 17 feet, 5 inches; December, 17 feet, 5 inches.
39. In none.
40. January, February, March, and moderately low the rest of the year.
43. There was no diphtheria in this locality.

Respectfully submitted,
Thornville, Mich. JOHN S. CAULKINS, M. D.

CENTRAL DIVISION OF THE STATE.*

REPLIES BY G. W. TOPPING, M. D., OF DE WITT, CLINTON CO., MICH.

1. Unincorporated village. Population by census 1880 is 292 persons.
2. Two deaths in village.
3. Township De Witt.
4 and 5. About the same.
6. Whooping-cough was unusually prevalent, but caused no deaths.
7. Whooping-cough spread in the schools and all were exposed before its presence was ascertained, therefore the schools kept on.
8. None in particular.
10, 12, 14, and 15. None.
16. Whooping-cough from spring to winter, and scarlatina and mumps in spring.
17. Scarlet fever, 19; typhoid fever, 9; measles, 15; whooping-cough, 28; diphtheria, 8.
18. Small-pox, Asiatic cholera, cerebro-spinal meningitis.
19. Yes. Whooping-cough.
20. No. The schools were not closed, but were constantly attended in some districts with pupils having whooping-cough.
21. *January:* Bronchitis, tonsillitis, pneumonia, whooping-cough, rheumatism and neuralgia.
    February: Bronchitis, tonsilitis, whooping-cough, pneumonia.
    March: Bronchitis, whooping-cough, tonsilitis, pneumonia, rheumatism and neuralgia.
    April: Whooping-cough, bronchitis, pneumonia, tonsilitis, rheumatism, intermittent fever, remittent fever, neuralgia.
    May: Whooping-cough, bronchitis, tonsilitis, scarlatina, intermittent fever, rheumatism, remittent fever, measles, mumps.
    June: Whooping-cough, bronchitis, tonsilitis, intermittent fever, remittent fever, diarrhea, neuralgia, mumps.
    July: Intermittent fever, diarrhea, remittent fever, bronchitis, dysentery, tonsilitis, neuralgia.
    August: Diarrhea, intermittent fever, remittent fever, typhoid fever, dysentery, bronchitis.
    September: Diarrhea, dysentery, intermittent fever, remittent fever, typhoid fever, bronchitis, neuralgia, consumption.
    October: Diarrhea, intermittent fever, remittent fever, tonsilitis, bronchitis, neuralgia, typhoid fever, rheumatism, diphtheria, consumption.
    November: Bronchitis, tonsilitis, diphtheria, diarrhea, intermittent fever, neuralgia, rheumatism, consumption, scarlatina.
    December: Bronchitis, tonsilitis, rheumatism, neuralgia, intermittent fever, remittent fever, pneumonia, mumps, consumption.
22. Some catarrhal disease in spring and fall among horses generally called epizooty. Some distemper or epidemic catarrh. Not severe or fatal.
23. No hog cholera in this section.
24. None.
25. Nothing of the kind.
27. Wheat wet when threshed got musty quite generally. Oats smutty and often musty. Crops secured damp quite generally.
28. Only smut.
29. No.
30. Yes.
31. More.
32. Cannot.
34. The entire spring, summer, and fall was extraordinarily wet. June the driest month; July very wet.
35. July, the latter part of August, and September were unusually wet.
36. Cannot.
37. One-half mile west of village, 10 feet; village, 25 to 50 feet; sections 9, 10, 22, 23, 24, generally 40 to 50 feet.
38. Varies with locality from 2 feet to 75 feet. Will vary from one extreme to the other in one-half mile distance according to elevation.
39. The entire summer, spring, and fall.
40. None.
43. In one case it was brought from North Lansing by a convalescent patient, and ran through two families, resulting in a death in each family. The first family lived in Olive township, the second in De Witt.

The southern portion of this township lies nearer Lansing than the village of De Witt, and as they employ Lansing physicians, we have no means of knowing of the sickness and deaths in that part of this township prior to the supervisors taking the assessment, which comes too late for this report.

Respectfully,
De Witt, Mich. G. W. TOPPING, M. D.

REPLIES BY H. C. FAIRBANK, M. D., OF FLINT, GENESEE CO., MICH.

1. 9,000.
2. 86.
3. City of Flint.
4. Greater, by about 100 cases of diphtheria at the Deaf and Dumb Institute.
5. Greater. Cannot state accurately—no records.
6. Consumption, diphtheria, and scarlatina.
7. The coolness and humidity of the atmosphere is believed to be the cause.
8. Various forms or kinds of fever.
9. Better modes of living and improved sanitary conditions.
10. Consumption.
11. See No. 7.
12. Diarrheal diseases.
13. See No. 9.
14. Consumption ranks first and is noticed for autumnal and first winter months.
15. Fevers and diarrheal affections.
16. No new affections particularly noticed.
17. Typhoid fever, 4; measles, 1; diphtheria, 7.
18. Small-pox, cholera, cerebro-spinal meningitis, whooping-cough.
19. Diphtheria, scarlet fever and measles.
20. None closed on account of the prevalence of any disease.
21. No definite reports could be obtained.
    September: Diphtheria (11).
    October: Scarlet fever (19).
    November: Scarlet fever (11).

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* For counties included in each division, see Exhibit 1, page 257.

December: Diphtheria—over 100 cases at the Deaf and Dumb Institute.

22.* Epizooty prevailed among horses quite generally during autumnal months. Hog cholera not noted here.

23. No.

24. None noted.

25. None.

26. Not noted.

27. Poor from wet weather.

29. No.

30 and 31. Yes.

32. No meteorological records kept. Generally cool and wet.

33. Rainfall pretty generally distributed over the spring, summer, and autumn months.

34. None were dry.

35. Moist every month in the year.

36. No records, but wells generally unusually full.

37. Varies from 20 to 45 feet.

38. Cannot say with sufficient accuracy.

39. Spring, summer, and autumn.

41. Foul air and impure drinking-water.

42 and 43. Cannot say how they originated, but they spread in our schools generally.

H. C. FAIRBANK, M. D.,
Flint, Mich., March 1, 1881. *Health Officer.*

REPLIES BY J. MARSHALL, M. D., OF GAINES, GENESEE CO., MICH.

1.* Village, 348.

2. Seven.

3. The village of Gaines.

4. One-half more.

5. Three more.

6. Diphtheria.

7. Taking a body dead from diphtheria in the church.

10. Diphtheria.

17. Typhoid fever, 8; whooping-cough, 20; cerebro-spinal meningitis, 1; diphtheria, 30.

19. Diphtheria and whooping-cough.

20. When schools closed diphtheria disappeared; when they commenced, it increased.

Gaines, Mich. J. MARSHALL, M. D.

REPLIES BY A. P. DRAKE, M. D., OF HASTINGS, BARRY CO., MICH.

1.* City, 2,510.

3. From six to eight miles radius from this city.

4 and 5. About the average.

6. Did not observe any marked difference of previous years.

17. Measles, 8 to 10; whooping-cough prevalent; diphtheria, a very few. Cannot give numbers.

18. Small-pox, cholera, scarlet fever, typhoid fever, cerebro-spinal meningitis.

19. Whooping-cough.

20. No.

22. During the months of November and December the so-called epizooty was somewhat prevalent. It seemed to be a catarrhal affection of the nasal passages.

23 and 24. No.

26. Rust in wheat and mildew in grasses.

27. Generally good, but more than the usual amount injured by wet weather.

28. Very little in corn.

29. No.

30. Greater.

31. More.

37. From twenty to fifty feet.

42. No scarlet fever in this vicinity.

43. It seemed to be indigenous, as there was only occasionally sporadic cases.

Hastings, Mich. A. P. DRAKE, M. D.

REPLIES BY W. F. REED, M. D., OF THE STATE HOUSE OF CORRECTION AND REFORMATORY, IONIA, IONIA CO., MICH.

1.* Prison. Average 400.

2. Two.

3. Michigan State House of Correction and Reformatory.

4. About the same.

5. Same. We had two deaths in 1879 and two in 1880.

6. Diphtheria. See 17 and 43.

8. Measles—16 cases in 1879.

10. I death from pneumonia, I death from pulmonary consumption.

14. Pneumonia, 1 death; consumption, 1 death.

17. Diphtheria, 8 cases in December, 1879, and 8 in 1880; 21 cases of ulcerated sore throat; 2 cases of typho-malarial fever.

18. Small-pox, cholera, scarlet fever, typhoid fever, measles, whooping-cough, cerebro-spinal meningitis.

21. *January:* Ulcerated sore throat, ague, diarrhea, diphtheria, neuralgia, bronchitis, tonsilitis, consumption.

February: Intermittent fever, neuralgia, tonsilitis, pneumonia, erysipelas, diphtheria, remittent fever, consumption.

March: Intermittent fever, neuralgia, tonsilitis, rheumatism, inflammation of bowels, diarrhea.

April: Intermittent fever, tonsilitis, pleuritis, diarrhea, rheumatism.

May: Neuralgia, intermittent fever, diarrhea, remittent fever.

June: Intermittent fever, neuralgia, pneumonia, dysentery.

July: Diarrhea, intermittent fever, dysentery, neuralgia, consumption.

August: Diarrhea, intermittent fever, dysentery, neuralgia, erysipelas, pneumonia, typho-malarial fever, consumption.

September: Diarrhea, tonsilitis, intermittent fever, pneumonia, neuralgia, consumption.

October: Intermittent fever, diarrhea, rheumatism, tonsilitis, pneumonia, consumption.

November: Neuralgia, rheumatism, intermittent fever, tonsilitis, diarrhea, consumption, dysentery, erysipelas.

December: Tonsilitis, rheumatism, pneumonia, neuralgia, consumption, erysipelas, enteritis.

22. One case of pneumonia in a horse. Some "distemper" among horses. No "hog cholera."

23. No.

24. None among us.

25. I do not know of any.

26. No diseases. Some insects.

27. We raised corn for our own use and got it in in good condition.

28. None that I know of.

29 and 30. We raised none.

31. Less affected. We got our hay in in good shape.

33. None.

35. May and June.

36. We have no wells. Get water from spring.

37. Our land varies in altitude above sea level. About 5 feet in places and 50 feet in others.

38. I can give no data.

39. May and June.

40. August and September.

42. Did not.

43. A prisoner was received from Kalamazoo on Dec. 3, 1879. Diphtheria made its appearance on Dec. 6, 1879, in said prisoner. I attribute the prevalence of the disease to this.

W. F. REED, M. D.
State House of Correction and Reformatory,
Ionia, Mich.

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* The figures beginning paragraphs refer to questions in Circular 40, printed (in small type) on pages 253-272 of this Report. A summary of the replies is printed on pages 253-272.

REPLIES BY L. S. STEVENS, M. D., OF MUIR, IONIA CO., MICH.

1. Village of Muir, 800.

2. Eight, though upon reflection I find two were outside the corporation.

3. About five miles north, east and west. I do not practice south.

4. The same as the average.

5. I judge about the same.

6. None.

11. None, except cancerous affections; there being three deaths in my practice during the year from this disease.

14. Cancer of the stomach, Feb., 1880; cancer of the breast, Aug., 1880; cancer of the womb, Sept., 1880.

17. Typhoid fever, 3; measles, 6; diphtheria, 2.

18. Small-pox, cholera, scarlet fever, whooping-cough, cerebro-spinal meningitis.

19 and 20. No.

21. *January:* Consumption, rheumatism, bronchitis, intermittent fevers.

February: Bronchitis, influenza, rheumatism, intermittent fevers.

March: Influenza, inflammation of lungs, intermittent fevers.

April: Bronchitis, rheumatism, intermittent fevers.

May: Intermittent fever, typhoid fever, rheumatism.

June: Intermittent fever.

July: Intermittent fever.

August: Intermittent fever; typho-malarial fever.

September: Intermittent fever, diarrhea.

October: Intermittent fever, influenza.

November: Intermittent fever, influenza.

December: Intermittent fever, measles, influenza.

22. I did not notice any except a catarrhal affection among horses during the fall and commencement of winter, horsemen called it horse distemper.

23. No.

26. None.

27. In good condition.

28. No.

29. Yes.

30 and 31. No.

32. Not having suitable apparatus I was unable to make any definite observation.

33. Could not answer correctly. There were no extremes during the year.

36. Jan., about 3 feet; Feb., 3 feet; March, 3 feet; April, 3½ feet; May, 3 feet; June, 3 feet; July, 2½ feet; Aug., 2 feet; Sept., 2 feet; Oct., 2½ feet; Nov., 2½ feet; Dec., 3 feet.

37. The surface being hilly it varies from about 10 feet near the river to 35 and 40 feet back upon the hills.

38. It does not vary much from answer to question 36.

43. Two or three cases attended by other physicians which proved fatal, in the north part of the township, which they called diphtheria; yet having had cases in the vicinity similar though not fatal, I could not diagnose diphtheria.

Muir, Mich. L. S. STEVENS, M. D.

REPLIES BY G. E. CORBIN, M. D., OF ST. JOHNS, CLINTON CO., MICH.

1. Village, 2,500.

2. Nineteen; embraces a list made of each death heard of, and carefully noted at the time.

3. The village of St. Johns.

4. About the same.

5. About the average.

10. Consumption, I think.

16. A few cases of typhoid fever, which is not at all common here.

17. Cannot give the number of scarlet fever, typhoid fever, measles, whooping-cough, and diphtheria. None prevailed extensively.

18. Small-pox, cholera, cerebro-spinal meningitis.

19. Am not certain.

20 and 23. No.

27. Good.

31. More.

32. *January:* Mild weather. Mercury several times as high as 50° F. in shade.

February: On 19th we had thunder, lightning, and rain; mercury on 28th 54° F. in shade.

March: Mild temperature. On 4th temp. was 56° F. Barometer 28.30, with high wind.

April: On 14th temp. 76° F. in shade. Barometer 28.65, with high wind.

May: On 3d temp. 80° F. and on 4th 82° F. in shade. Very much rain this month.

June: Excessively wet. Very much rain during whole month.

July: Much rain. Temp. from 90° to 95° F. in shade much of the time for first half of month.

August: Middle of Aug. "dry and dusty." Last week of Aug., "very wet."

September and *October:* Pleasant and usual weather for these months.

November: Ground bare and steady cold weather.

December: Ground bare and much very cold weather. Temp. 12 to 15 degrees below zero several times.

35. May, June, and July.

36. There is no average depth. The depth depends on how well the "quick sand" has been excavated and excluded.

37. Five to 15 feet north of the ridge, and 25 to 35 feet south of the ridge.

38. The distance has already been given, and varies but a foot or two between dry and wet seasons.

39. June, July, August, and September.

St. Johns, Mich. G. E. CORBIN, M. D.

REPLIES BY R. B. SMITH, M. D., OF WEBBERVILLE, INGHAM CO., MICH.

1. 490.

2. Four.

3. Township of LeRoy.

4. Twenty-five per cent less.

5. Twenty per cent less.

6. None.

9. General improvement of low lands, improved condition of inhabitants, etc.

10. None.

12. Diphtheria, cholera infantum, lung diseases.

14 and 16. None.

17. Scarlet fever, 23; typhoid fever, 2; whooping-cough, 1; diphtheria, 6.

18. Small-pox, cholera, measles, cerebro-spinal meningitis.

19 and 20. No.

21. *January:* Whooping-cough, intermittent fever, influenza, tonsilitis, consumption, typhoid fever, rheumatism.

February: Whooping-cough, intermittent fever, influenza, remittent fever, diarrhea, consumption.

March: Influenza, intermittent fever, remittent fever, tonsilitis, consumption.

April: Intermittent fever, scarlet fever, diphtheria, remittent fever, tonsilitis, consumption.

May: Intermittent fever, bronchitis, tonsilitis, pneumonia, diarrhea, consumption.

June: Intermittent fever, diarrhea, consumption, rheumatism, neuralgia.

July: Dysentery, diarrhea, intermittent fever, bronchitis, remittent fever, consumption.

August: Intermittent fever, remittent fever, diarrhea, cholera infantum, neuralgia, consumption.

September: Intermittent fever, remittent fever, diarrhea, pneumonia, rheumatism, consumption.

October: Itermittent fever, diarrhea, remittent fever, cholera morbus, tonsilitis, consumption.

November: Intermittent fever, cholera morbus, scarlet fever, consumption, rheumatism.

December: Influenza, intermittent fever, bronchitis, typhoid fever, consumption, rheumatism.

22. Diseases among horses, characterized by cough, swelling of glands of neck, discharge from nose, during November and December, 1880.

23, 24, and 25. None.

26. Rot among potatoes, mould in wheat and hay.

27. Wheat damp and mouldy, and in poor condition for market.

28. Not known.

29. No.

30. Greater.

31. None.

32. No data.

34. None.

35. January to July inclusive.

39. January, February, March, April, May, June and July.

40. None.

41. No data.

42 and 43. Not positively known.

Webberville, Mich. R. B. SMITH, M. D.

SOUTH-WESTERN DIVISION OF THE STATE.[*]

REPLIES BY S. BELKNAP, M. D., OF NILES, BERRIEN CO., MICH.

1.[†] City.

2. Sixty-seven.

3. City of Niles.

4. About the same.

5. Greater. Slightly increased.

6. During January and February, scarlet fever.

8. Malarial.

9. Evenness of temperature.

10. Scarlatina.

11. Severity of the epidemic.

12. Typhoid or malarial fever.

14. Scarlatina, January and February.

17. Scarlet fever, 60; typhoid fever, 10; measles, 25; whooping-cough, 50; diphtheria, 20. These are from estimates.

18. Small-pox, cholera, cerebro-spinal meningitis.

19. By some it was thought scarlet fever was spread, but not to any extent, as ordinary care was taken.

20. No.

21. *January:* Influenza, scarlatina, rheumatism, erysipelas, whooping-cough, remittent fever, typho-malarial fever.

February: Influenza, follicular tonsilitis, pneumonia, rheumatism, typho-malarial fever, scarlatina, consumption (pulmonary).

March: Typho-malarial fever, influenza, pneumonia, rheumatism, tonsilitis, whooping-cough, scarlatina, consumption.

April: Consumption, rheumatism, influenza, typho-malarial fever, pneumonia, measles, erysipelas, intermittent fever.

May: Remittent fever, intermittent fever, consumption, erysipelas, measles, pneumonia, neuralgia, whooping-cough.

June: Intermittent fever, remittent fever, consumption, typho-malarial fever, neuralgia, rheumatism, whooping-cough, measles.

July: Intermittent fever, remittent fever, diarrhea, cholera morbus, cholera infantum, neuralgia, rheumatism, consumption, diphtheria.

August: Intermittent fever, remittent fever, typho-malarial fever, cholera morbus, cholera infantum, consumption, diarrhea, dysentery.

September: Intermittent fever, remittent fever, typho-malarial fever, measles, influenza, enteric fever, consumption.

October: Intermittent fever, remittent fever, typho-malarial fever, influenza, rheumatism, tonsilitis, neuralgia, consumption, diphtheria.

November: Influenza, tonsilitis, remittent fever, intermittent fever, erysipelas, consumption, neuralgia, rheumatism.

December: Influenza, tonsilitis, remittent fever, intermittent fever, erysipelas, neuralgia, rheumatism, pneumonia, consumption.

22. Hog cholera during Aug., Sept., and Oct. Not general, but in certain localities quite fatal. Epizooty among horses in Dec. Mild but quite general.

23 and 24. No.

25. I knew two cases of diphtheria—sporadic. The father stated that the boy played with a sick pig. The case presented some peculiarities and was fatal.

26. None to mention.

27. Good.

28. No.

29. Yes.

30. No.

31. Less.

32. Have not kept a record, but nothing unusual occurred.

33. July, March, Sept., Oct., January, Feb., Nov., Dec., April, June, Aug., May.

34. Do not think it was unusually dry, but was the driest in July.

35. Do not think it was unusually moist.

36. Cannot.

37. Varies from 10 to 40 feet, and in some localities it comes quite near the surface.

38. Cannot.

39. The amount of rain during the year I judge to be about the usual amount, and quite evenly divided.

40. I do not think it was unusually low at any time during the year.

42. Cause of first cases unknown, after which they could be generally traced to some one of the cases preceding either directly or indirectly.

43. Sporadic cases, causes unknown.

Niles, Mich. S. BELKNAP, M. D.

REPLIES BY MILTON CHASE, M. D., OF OTSEGO, ALLEGAN CO., MICH.

1.[†] 1,000.

2. Nine, according to a record I keep supposed to be correct.

3. This village and town, part of Watson, and Trowbridge, of this county, and of Pine Grove, Van Buren county, and Alamo, Kalamazoo county.

4. A small per cent less.

5. About the same.

6. Bilious fever was more prevalent and caused more deaths.

7. The unusually wet season.

8. Less ague, no deaths from diphtheria, from which there were many in 1879.

9. To absence of epidemics of contagious disease.

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[*] For counties included in each division, see Exhibit 1, page 257.

[†] The figures beginning paragraphs refer to questions in Circular 40, printed (in small type) on pages 253-272 of this report. A summary of the replies is printed on pages 253-272.

10. Bilious fever.
11. Unusually wet season.
12. None.
14 and 15. None.
16. Opium habit, 1; tabes mesenterica, 1; cancer, 1; hemorrhage of bowels, 1; too-much-quack-doctor, 1.
17. Measles, a few; whooping-cough, 100 or more; diphtheria, few.
18. Small-pox, cholera, scarlet fever, typhoid fever, cerebro-spinal meningitis.
19 and 20. No.
21. *January:* Bronchitis, intermittent fever, influenza, rheumatism, neuralgia, consumption; a case each of cancer and traumatic tetanus.
February: Influenza, bronchitis, intermittent fever, neuralgia, rheumatism, consumption, pneumonia.
March: Influenza, bronchitis, neuralgia, rheumatism, intermittent fever, pneumonia, consumption, measles.
April: Bronchitis, influenza, intermittent fever, rheumatism, pneumonia, measles, consumption, neuralgia.
May: Whooping-cough. neuralgia, influenza, bronchitis, intermittent fever, rheumatism, consumption, pneumonia, diphtheria (doubtful).
June: Whooping-cough, influenza, intermittent fever, remittent fever, bronchitis, consumption, neuralgia, rheumatism, croup.
July: Whooping-cough, intermittent fever, remittent fever, consumption, erysipelas, scarlatina (some doubt), cholera morbus, diarrhea, dysentery.
August: Whooping-cough, diarrhea, dysentery, intermittent fever, consumption, rheumatism, cholera morbus, remittent fever, hay asthma.
September: Remittent fever, intermittent fever, dysentery, rheumatism, diarrhea, whooping-cough, consumption, hay asthma.
October: Remittent fever, intermittent fever, rheumatism, neuralgia, bronchitis, erysipelas.
November: Intermittent fever, neuralgia, rheumatism, consumption, remittent fever, influenza, bronchitis, erysipelas, tonsilitis.
December: Influenza, neuralgia, rheumatism, intermittent fever, consumption, bronchitis.
22. Pneumonia among horses.
23. No hog-cholera in other animals.
26. Don't think there was.
27. Oats light, buckwheat light and scarce, corn soft and unripe.
28. More fungus than usual on corn.
29. Yes.
30. Less.
31. Not more.
83. A wet season all through; April, May, June wettest.
34. None.
35. All of them.
37. Village, about 18 feet; north and west, 50; west, 80; south, 20; east, 20.
39. All.
40 and 41. None.
42. Very doubtful, quacks report a case or two.
43. None, probably. Quacks mention some.

Otsego, Mich. MILTON CHASE, M. D.

REPLIES BY C. P. WELLS, M. D., OF POKAGON, CASS CO., MICH.

1. About 2,000 in the township.
2. Do not know.
3. Pokagon village and surrounding country 3 or 4 miles adjacent.
4 and 5. Same as average.
6. None more prevalent.
7. Cannot.
8. Diphtheria, scarlet fever, pneumonia.
9. Sanitary regulations.
10 and 11. None.
12. Pneumonia.
13. Mild winter.
14, 15, and 16. None.
17. Scarlet fever, 3; measles, 9; whooping-cough, 1.
18. Small-pox, cholera, typhoid fever, cerebro-spinal meningitis, diphtheria.
19 and 20. No.
21. *January:* Influenza, rheumatism, neuralgia.
February: Influenza, rheumatism, bronchitis.
March: Influenza, bronchitis, pneumonia, pleurisy, neuralgia.
April: Influenza, intermittent fever, bronchitis, rheumatism.
May: Intermittent fever, measles, remittent fever, influenza.
June: Intermittent fever, remittent fever, diarrhea.
July: Intermittent fever, remittent fever, diarrhea, cholera morbus.
August: Intermittent fever, remittent fever, typho-malarial fever, diarrhea, cholera morbus, cholera infantum, dysentery.
September: Intermittent fever, remittent fever, typho-malarial fever, cholera infantum, diarrhea, dysentery.
October: Intermittent, remittent, and typho-malarial fevers, diarrhea, erysipelas.
November: Intermittent fever, erysipelas, influenza, quinsy.
December: Influenza, rheumatism, erysipelas, quinsy, croup.
22. A disease called "hog cholera" has been unusually prevalent.
23. A disease among hens.
24 and 25. I do not.
26. None.
27. Good.
28. No.
29. Yes.
30. Did not.
31. Hay crop was good.
32. Did not keep a record.
34. August and September.
35. March and April.
37. From 14 to 18 feet deep in creek bottom, and in higher localities from 30 to 50 feet.
39. Highest in March and April.
40. If at all in September.

Pokagon, Mich. C. P. WELLS, M. D.

SOUTHERN CENTRAL DIVISION OF THE STATE.*

REPLIES BY A. W. ALVORD, M. D., OF CLINTON, LENAWEE CO., MICH.

1. Nearly 1,000.
2. Eight.
3. Four miles wide by six long from east to west.
4 and 5. About the same.
6. Scarlet fever.
7. Epidemic.
8. Malarial diseases.
10. None.
12. Scarlatina.
13. Mild type of disease.
17. Scarlet fever, 30 (approximate); cerebro-spinal meningitis, 2; diphtheria, 3.
18. Small-pox, cholera, typhoid fever, measles, whooping-cough.
19. Yes. Scarlatina.
20. No.

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*For counties included in each division, see Exhibit 1, page 257.

21.* *January and February:* Pneumonia, bronchitis.
March: Rheumatism, neuralgia.
April: Rheumatism.
May and June: Malarial fevers.
July: Diarrhea, dysentery, malarial fevers.
August: Dysentery, malarial fevers.
September: Dysentery, bilious fevers.
October: Malarial fevers.
November: Malarial fevers.
December: Influenza, bronchitis, pneumonia.

22. In December, horses suffered from an inflamed condition of the air passages, especially of the head.

23. No.

24. None.

26. None to any general extent.

27. Good.

28. No.

29. Yes.

30 and 31. Less.

32. Cannot do it.

34. None.

35. June.

37. From fifteen to twenty-five feet.

39 and 40. None.

42. Direct contagion usually. People were very careless in spite of every effort to prevent carelessness.

Clinton, Mich. A. W. ALVORD, M. D.

REPLIES BY J. W. FALLEY, M. D., OF HILLSDALE, HILLSDALE CO., MICH.

1.* About 4,000.

2. I gave the number in my other report, I think, 39.

3. Hillsdale city.

4. Less. We had a "boom" of measles, mumps, and whooping-cough, but so light as to hardly be called sickness.

5. A little less.

6. None. There was much less bilious or miasmatic disease than last year.

7. The measles were imported, mumps and whooping-cough appeared to "drop down."

8. All miasmatic diseases, though 1879 was not a dying year.

9. More even distribution of rain.

10. It seemed to be a closing up time for very old people and those with chronic ailments.

11. There was no particular or unusual mortality.

12. Less of miasmatic diseases or fevers.

13. The mortality was not so particularly lessened as the sickness, if we omit the usually light contagious diseases.

14. None.

15. I may say very few died except the very old or those broken down by chronic disease.

16. None.

17. Typhoid fever, 1; measles, 60 to 100; whooping-cough, 50 to 70; diphtheria, may be nine. As I said in another report the contagious diseases were so light little account was taken of them.

18. Small-pox, cholera, scarlet fever, cerebro-spinal meningitis.

19. Undoubtedly. Measles, whooping-cough, and mumps.

20. No. Did not close any of the schools, though at times some had very few pupils. As I said, very little pains was taken to avoid the diseases, though not from carelessness.

21. *January:* Pneumonia, croup, catarrh—mild and few in number.
February: Just about as January.
March: Some pneumonia, colds, intermittent fevers, rheumatism.
April: Some pneumonia, colds, intermittent fever, rheumatism—healthy.
May: Very little sickness of any kind.
June: Measles, whooping-cough, erysipelas, intermittents, neuralgia—all mild except one case of rheumatism.
July: Measles, whooping-cough, mumps, remittent fevers, a little dysentery—all light.
August: Diarrhea, dysentery, neuralgia, intermittent fevers, mumps, measles, whooping-cough, rheumatism.
September: Intermittent fevers—light, neuralgia, rheumatism, diarrhea—usually light.
October: As in September, with a few hard cases of continued fever, of which myself partook.
November: All well. A little.
December: Almost no sickness. A little diphtheria, rheumatism.

22. Epizooty, *i. e.*, all the symptoms of catarrhal fever—with horses. Very few cases of hog-cholera. One case where a stock of hens died with about same symptoms.

23. Only in a few lots of hogs, and I know of only one lot of hens.

24 and 25. No.

26. Nothing.

27. Very good. But really as reporting for the city I have nothing to say to these questions, but I *can say*.

28. No.

30. Very little.

31. Good.

34. None.

35. In April, May and June.

36. *January:* Average.
February: Medium.
March, April, and May: High.
June and July: Medium.
August and September: Rather dry.
October and November: Medium.
December: Dry.

37. Varies much—about 35 feet; some 60 feet; one or two 80 feet; on the flat 16 to 20 feet. Drive 30 to 33 feet, and we get water from the hills, say 10 to 30 feet. Our ground and wells vary so much I do not know that I can answer 37 better than I have.

38. Wells on the hills or upland vary very little in dry or rainy seasons. Will answer on the flats. January and February, 12 feet; March, 12 or 10 feet; April, May, and June, 10 feet; July, 13 feet; August, 15 feet; September, 18 or 20 feet; October, 18 feet; November, 16 feet; December, 14 feet.

39. In none.

40. None—1880 was one of our best average.

41. Had very little, and light the past year.

42. It died out in winter and spring of 1880.

43. All appeared to be sporadic cases (if indeed they were diphtheria), except in one family where three children had it, one following the other.

Hillsdale, Mich. JOHN W. FALLEY, M. D.

REPLIES BY A. R. SMART, M. D., OF HUDSON, LENAWEE CO., MICH.

1.* About 2,400.

2. Ten.

3. 1 mile square, including village.

4 and 5. Ten per cent less.

6. Influenza, parotiditis, diarrhea, bronchitis.

7. Influenza, diarrhea, bronchitis, due to severe and sudden changes of temperature.

8. Less typhoid fever.

9. Do not know.

10. None.

12. From fevers of all types.

13. Lessened severity of disease.

14. Have had none. Has been an unusual mortality among aged people from all causes.

15. During winter months, influenza, tonsilitis, and pneumonia were prevalent, but few deaths.

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* The figures beginning paragraphs refer to questions in Circular 40, printed (in small type) on pages 253-272 of this Report. A summary of the replies is printed on pages 253-272.

16. None.

17. Typhoid fever, 12; measles, 20; whooping-cough, 30; diphtheria, 6. These are merely estimates; have no recorded facts.

18. Small-pox, cholera, scarlet fever, cerebro-spinal meningitis.

19. Yes; measles and whooping-cough.

20. Schools have not been closed except during vacation when no diseases were epidemic.

21. *January* and *February:* Measles, pneumonia, bronchitis.
   March and *April:* Pneumonia, bronchitis, measles.
   May and *June:* Fevers, whooping-cough.
   July and *August:* Diarrhea, fevers, whooping-cough.
   September and *October:* Fevers, diarrhea.
   November and *December:* Influenza, bronchitis, rheumatism, fevers.

22. Slight epidemic in Dec. and Nov. among horses, resembling epizooty.

23. No.

25. None.

26. Apples and potatoes rotted rapidly. Know of no trouble with grains or grasses.

27. Generally good.

28. No.

29. Yes.

30 and 31. Less.

32. Have no record of this.

33. Driest months, November and December. May, July, and August were dry. No unusual moisture.

34. November and December.

35. None.

36. Wells vary from 8 feet to 1 foot in depth of water.

37. In some places water is reached in 10 or 15 feet; in others it varies from 2 to 30 feet.

38. Have kept no record.

39. Not unusually high.

40. November and December.

Hudson, Mich. A. R. SMART, M. D.

REPLIES BY A. C. TAYLOR, M. D., OF MANCHESTER, WASHTENAW CO., MICH.

1. 1,150.

2. 6 to 8.

3. Village and township of Manchester, townships of Sharon and Freedom.

4. I think less. Only to a slight degree. Some portions of year being up to average and others much below it,

5. I think less. I cannot tell accurately.

6. Remitting fever and entero colitis of children.

7. In May, 1881, intensely high temperature without rain produced malaria, the swamps being full previously.

8. Inflammatory diseases, *e. g.* pneumonia and bronchitis.

9. To mild winter, no long continued cold, and plenty of rain during the winter months.

10. Pernicious remitting fever, nearly all occurring in May and June.

11. See No. 7.

12. Pneumonitis, bronchitis.

13. Moderate temperature during winter months.

14. May, June, Aug., and Sept.

16. Four cases of spinal meningitis in children as complicating other diseases and leaving more or less paralysis of lower extremities, and in one case death.

17. Scarlet fever, 6.

18. Small-pox, cholera, typhoid fever, measles, whooping cough, cerebro-spinal meningitis, and diphtheria.

19 and 20. No.

21. *January:* Influenza.
   February and *March:* Pneumonia.
   April: Bronchitis.
   May: Remitting fever.
   June: Remitting fever, intermitting fever.
   July: Intermitting fever, remitting fever.
   August and *September:* Remitting fever, cholera morbus, entero colitis.
   October: Intermitting fever.
   November and *December:* Cannot say.

22. In early spring (March and April) a form of "distemper" viz., coughing, nasal discharge, swelling of cervical glands, loss of appetite, etc., in horses was quite prevalent.

23 and 24. No.

25. Do not.

26. None.

27. Oats were "light" in weight owing to dry weather. Other grains were good quality.

28. No.

29. Yes.

30 and 31. Less.

Manchester, Mich. A. C. TAYLOR, M. D.

REPLIES BY H. C. CLAPP, M. D., OF MENDON, ST. JOSEPH CO., MICH.

1. 854.

2. Nine.

3. An area of five miles.

4 and 5. Same as the average.

6. Congestive.

7. Cannot.

8. None.

10. Congestive.

11. Cannot.

12. None.

14. Malignant fever, 13th of February, and 30th of September; congestion of lungs, 18th of April, and congestion of brain, 4th of August.

15. None.

16. Diphtheria May 15, November 25, December 1.

17. Typho-malarial fever, 1; diphtheria, 3.

18 Small-pox, cholera, scarlet fever, typhoid fever, measles, whooping-cough, cerebro-spinal meningitis.

19 and 20. No.

21. *January:* Bronchitis, neuralgia, pneumonia, rheumatism, tonsilitis, intermittents, remittents.
   February: Bronchitis, neuralgia, pneumonia, influenza, tonsilitis, rheumatism, hepatitis, consumption.
   March: Bronchitis, neuralgia, pneumonia, rheumatism, tonsilitis, consumption.
   April: Bronchitis, neuralgia, intermittent fever, pneumonia, rheumatism, tonsilitis, consumption.
   May: Bronchitis, intermittent fever, neuralgia, rheumatism, tonsilitis, pneumonia, diphtheria, erysipelas, consumption.
   June: Intermittent fever, neuralgia, bronchitis, consumption, tonsilitis, rheumatism, inflammation of bowels.
   July: Intermittent fever, diarrhea, neuralgia, bronchitis, cholera morbus, dysentery, remittent fever, pneumonia, consumption.
   August: Intermittent fever, diarrhea, remittent fever, cholera morbus, bronchitis, neuralgia, dysentery, consumption.
   September: Intermittent and remittent fevers, diarrhea, cholera morbus, neuralgia, bronchitis, consumption.
   October: Intermittent and remittent fevers, diarrhea, neuralgia, bronchitis, cholera morbus, tonsilitis, typho-malarial fever, consumption, pleuro-pneumonia.
   November: Intermittent and remittent fevers, neuralgia, bronchitis, tonsilitis, diphtheria, consumption.
   December: Intermittent and remittent fevers, neuralgia, bronchitis, tonsilitis, diphtheria, erysipelas, consumption.

22. Hog-cholera nearly the whole year, but particularly bad during the months of September, October and fore part of November.

23. Hens suffered much, and cats, rats, and mice were frequently found dead.

24. Cholera morbus frequently followed the eating of fresh pork.

25. A boy about five years of age ate a *raw* piece of Chicago sugar-cured ham, and was taken

vomiting the next day, fever immediately followed, and on the subsequent day profuse herpetic-like vesiculæ appeared upon the face and neck, disappearing in four or five days.

26. None.
27. Good.
28. No.
29. Yes.
30. Usual proportion.
31. No.
33. November, October, September, August, July, June, April, March, May, February, January.
34. July and August.
35. January, February, and May.
36. January, 4 feet; Feb., 4 feet; March, 3½ feet; April, 3 feet; May, 4 feet; June, 2½ feet; July, 2 feet; August, 1½ feet; September, 1½ feet; October, 1 foot; November, 1 foot; December, 1 foot.
37. About 17 feet.
38. January, 16 feet; February, 16 feet; March, 16 feet, 6 inches; April, 17 feet; May, 16 feet; June, 17 feet, 6 inches; July, 18 feet; August, 18 feet, 6 inches; September 18 feet, 6 inches; October, 19 feet; November, 19 feet; December, 19 feet.
39. January, February, May, March, April.
40. July and August—but not so low as in 1879, the whole of 1879 was drier than 1880.
43. Could trace it to no contagion or unhygienic conditions.

Mendon, Mich. H. C. CLAPP, M. D.

REPLIES BY C. M. WOODWARD, M. D., OF TECUMSEH, LENAWEE CO., MICH.

1.* 2,100 and a fraction.
2. 28.
3. Village of Tecumseh.
4. Two-thirds less.
5. Less. Unable to answer how much.
6. None special.
8. Scarlet fever and typhoid fever.
9. Better sanitary conditions.
10. None.
12. Scarlet fever and typhoid fever.
13. Better sanitation.
14 and 15. None prevailing.
16. None, except cerebro-spinal meningitis (July 12, 1880). Several cases occurred outside the village about this time. Only one in village—not fatal.
17. Scarlet fever, 4; typhoid fever, 1; cerebro-spinal meningitis, 1.
18. Small-pox, cholera, measles, whooping-cough, diphtheria.
19 and 20. No.
21. Have no data for these reports.
22. Nothing.
23. No.
24 and 25. None.
26. Do not know of any.
27. Good.
28. Not aware of any.
29. Yes.
30. Average.
33. Unable to do so.
34. Can give no answer.
35. No special change from previous years.
36. Does not vary materially.
37. Sixteen to 20 feet.
38. Does not vary more than a foot the whole year.
39. No special period.
40. So little variation am unable to report.
41. Nothing to communicate.
42. Sporadic case. No apparent contagious sources.
43. Diphtheria did not occur.

Tecumseh, Mich. C. M. WOODWARD, M. D.

REPLIES BY C. W. BACKUS, M. D., OF THREE RIVERS, ST. JOSEPH CO., MICH.

1.* Incorporated village, 2,525.
2. Thirty-two.
3. Village of Three Rivers, township of Lockport, county of St. Joseph.
4. Not very much less.
5. About the same.
6. Pneumonia about the only disease.
7. Frequent changes of temperature, and extreme damp, cold winds.
8. Malarial.
9. To drainage, and not much breaking of virgin soil.
10. Same as in No. 6.
11. Same as in No. 7.
12. Same as in No. 8.
13. Same as in No. 9.
14. Pneumonia, January, February and March.
15. Malarial fever. July, August, September, and October.
16. Spinal meningitis, March; diphtheria, March.
17. Typhoid fever, 1; whooping-cough, 50; cerebro-spinal meningis, 1; diphtheria, 2.
18. Small-pox, cholera, scarlet fever, measles.
19. Yes. Whooping-cough.
20. No.
21. *January:* Intermittent fever, bronchitis, influenza, neuralgia.
    February: Intermittent fever, bronchitis, influenza, remittent fever, pneumonia,
    March: Bronchitis, intermittent fever, influenza, pneumonia.
    April: Intermittent fever, bronchitis, influenza, rheumatism.
    May: intermittent fever, remittent fever, bronchitis, neuralgia.
    June: Intermittent fever, remittent fever, influenza, bronchitis.
    July: Intermittent fever, remittent fever, diarrhea, influenza.
    August: Intermittent fever, remittent fever, diarrhea, influenza.
    September: Intermittent fever, remittent fever, influenza, diarrhea.
    October: Intermittent fever, remittent fever, bronchitis, influenza.
    November: Intermittent fever, bronchitis, remittent fever, neuralgia.
    December: Intermittent fever, bronchitis, remittent fever, neuralgia, rheumatism.
22. Hog-cholera during the fall, chicken cholera during the summer and early fall months, epizootic among horses in the fall.
23. No.
24 and 25. None.
26. None that did any injury.
27. Good crop, harvested in good condition.
28. None of any account.
29, 30, and 31. Don't know.
37. About 20 to 25 feet; does not vary much.
42. None.
43. But two cases, and they were not reported, so that I was not called to investigate any of the facts, but the cases were in one family and did not spread.

Three Rivers, Mich. C. W. BACKUS, M. D.

REPLIES BY N. H. CLAFLIN, M. D., OF UNION CITY, BRANCH CO., MICH.

1.* 1,300. (I cannot ascertain the exact number. This is very near it.)
2. Twenty-two.
3. Six miles square with Union City as the center.
4 and 5. Same as average.
6. Measles only.
7. No cause assigned. It had been 12 years since measles prevailed.
8. None.
10. More cases are said to have died of "heart disease."

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* The figures beginning paragraphs refer to questions in Circular 40, printed (in small type) on pages 253-272 of this Report. A summary of the replies is printed on pages 253-272.

11. Cannot.

12, 14, and 15. None.

16. None, unless measles. It prevailed here in Jan. and Feb., also some in March and April.

17. Measles, about 400; whooping-cough, 30 or 40; diptheria, 15 or 20. *Many* were called diphtheria, perhaps there were none *truly* that.

18. Small-pox, cholera, scarlet fever, typhoid fever, cerebro-spinal meningitis.

19. Yes; measles.

20. No; the schools were not closed.

21. *January:* Intermittent fever, typho-malarial fever, tonsilitis, bronchitis, neuralgia, rheumatism.
February: Measles, bronchitis, intermittent fever, tonsilitis, typho-malarial fever, neuralgia.
March: Measles, bronchitis, intermittent fever, neuralgia, consumption, tonsilitis.
April: Measles, intermittent fever, bronchitis, consumption, pneumonia, rheumatism.
May: Tonsilitis, bronchitis, intermittent fever, neuralgia, consumption, rheumatism.
June: Intermittent fever, neuralgia, rheumatism, typho-malarial fever, diphtheria, consumption.
July: Neuralgia, intermittent fever, diphtheria, bronchitis, rheumatism, diarrhea.
August: Intermittent fever, diarrhea, dysentery, bronchitis, typho-malarial fever, neuralgia.
September: Dysentery, diarrhea, intermittent fever, typho-malarial fever, neuralgia, rheumatism.
October: Intermittent fever, typho-malarial fever, diphtheria, tonsilitis, neuralgia, bronchitis.
November: Intermittent fever, typho-malarial fever, diphtheria, tonsilitis, bronchitis, neuralgia, rheumatism.
December: Influenza, bronchitis, intermittent fever, tonsilitis, diphtheria, typho-malarial fever, pneumonia.

22. During the latter part of November and in December the epizootic and so called "hog cholera" prevailed.

23. Yes.

24. No.

25. None.

26. I know of none.

27. Good.

28. Not unusually so.

29. Yes.

30. Usual proportion.

31. Neither.

32. *January:* Cool, not cold, and dry. No snow on the ground.
February: Warmer than usual and more rain.
March: Cool, but more rain than usual. High water.
April: Warm, but much rain and unusually high water.
May: Dry, pleasant, warm, at first. Last of the month wet.
June: Rainy first week and most of second, then clear and warm.
July: Occasional showers, but mostly clear and pleasant.
August: Dry and hot.
September: Wet in early part, then pleasant, cool, and dry.
October: Pleasant, cool, weather. Frost the fifth. Dry and frosty.
November: Dry, cool, pleasant. Snow from middle of month.
December: Cold, snow, but not sleighing.

33. August, September, July, June, May, October, November, December, January, February, March, April.

34. None.

35. February, March, and April.

36. Jan., 9 ft.; Feb., 9 ft.; March, 10 ft.; April, 11 ft.; May, 8 ft.; June, 7 ft.; July, 7 ft.; Aug., 4 ft.; Sept., 6 ft.; Oct., 8 ft.; Nov., 8 ft.; Dec., 9 ft.

37. Forty feet deep, but along river valley it is only 8 to 18 feet.

38. Jan., 31 ft.; Feb., 31 ft.; March, 30 ft.; Apr., 29 ft.; May, 32 ft.; June, 33 ft.; July, 33 ft.; Aug., 36 ft.; Sept., 34 ft.; Oct., 32 ft.; Nov., 32 ft.; Dec., 31 ft. This is back from the river valley.

39. February, March, and April.

40, 41, and 42. None.

43. Some was reported, but others in same family would not have it, and I believe there were *no* cases of true diphtheria in this vicinity.

Union City, Mich. N. H. CLAFLIN, M. D.

REPLIES BY S. C. VAN ANTWERP, M. D., OF VICKSBURG, KALAMAZOO CO., MICH.

1. 800.

2. Seventeen.

3. Village of Vicksburg.

4. One-third greater.

5. Greater.

6. Old age, and malaria complicating other diseases.

7. I think the cause in general was remote or rather the remote cause was an intensity of malarial influence.

17 and 18. None of them occurred so far as I am aware.

19. No.

22. There were many cases of hog-cholera but not many in the immediate circle of country reported here.

26. None.

27. Good.

28. Nothing more than usual.

29. Yes.

31. Very little affected.

33. Farmers were kept from planting corn in some parts of the township east of Vicksburg. In May and June we had more than the usual amount.

34. August and September.

35. June.

37. Twelve to fifteen feet average depth of wells.

38. The rainfall does not greatly affect our wells.

39. June and May.

S. C. VANANTWERP, M. D.
Vicksburg, Mich.

REPLIES BY EDWARD BATWELL, M. D., OF YPSILANTI, WASHTENAW CO., MICH.

1. City.

3. City of Ypsilanti.

4 and 5. About the same.

6. Phthisis.

7. The sudden and great cold.

8. Typhoid fever.

9. Better attention to strict cleanliness of the city.

17. Small-pox, 1; scarlet fever, 10; typhoid fever, 15; whooping-cough, 50; cerebro-spinal meningitis, 3; diphtheria, but 1 genuine case; several of phagedenic ulceration of fauces.

18. Cholera, measles.

19. No.

20. None.

22. Epizootic designates a distinct disease, similar to acute catarrh, and extending down the lungs through the bronchi.

24. Do not know of any.

25. Know nothing about it.

26. None occurred.

27. Good.

28. Not in this locality.

29. Yes.

30. No case of banking heard of.

31. In some localities.

33. July, August, December.

34. December.

35. August.

37. About 30 feet.

39. August.

40. December.

41. One case of variola occurred in a three-months old child, in a house where, one year ago, a case of mild varioloid existed.

42. Do not know, firmly believe it was spontaneous.

43. Originated in an old woman, and to prove its being genuine she died.

Ypsilanti, Mich. **EDWARD BATWELL, M. D.**

SOUTH-EASTERN DIVISION OF THE STATE.[*]

REPLIES BY JUDSON BRADLEY, M. D., OF DETROIT, WAYNE CO., MICH.

1.[†] 129,000.
2. 2,400.
3. Detroit and suburbs.
4 and 5. About same.
18. Cholera and small-pox, so far as known.
19. Has not.
20. I have not.
21. *January* and *February:* No report.
  March: Influenza, intermittent fever, bronchitis, diphtheria, neuralgia, whooping-cough, consumption.
  April: Influenza, intermittent fever, catarrhal pneumonia, diphtheria, neuralgia, tonsilitis, bronchitis, consumption.
  May: Intermittent fever, influenza, neuralgia, bronchitis, pneumonia, scarlatina, whooping-cough, diphtheria, consumption.
  June: Intermittent fever, remittent fever, whooping-cough, measles, rheumatism, bronchitis, consumption.
  July: Cholera infantum, intermittent fever, diarrhea, typho-malarial fever, whooping-cough, enteritis, tonsilitis, consumption.
  August: Intermittent fever, typhoid fever, diarrhea, cholera infantum, whooping-cough, consumption.
  September: Intermittent fever, diarrhea, typhoid fever, tonsilitis, whooping-cough, consumption.
  October: Intermittent and typhoid fevers, influenza, neuralgia, whooping-cough, erysipelas, diarrhea, bronchitis, consumption.
  November: Intermittent fever, typhoid fever, influenza, diphtheria, whooping-cough, consumption.
  December: Influenza, intermittent fever, typhoid fever, neuralgia, tonsilitis, bronchitis, consumption,
42 and 43. Not known how communicated.

Detroit, Mich. **JUDSON BRADLEY, M. D.**

REPLIES BY J. M. SWIFT, M. D., OF NORTHVILLE, WAYNE CO., MICH.

1.[†] Northville, 934—census last June.

2. 12 (exact), for village only.

3. Village of Northville and contiguous portions of Novi, Salem, Livonia, and Plymouth townships.

4. About the same.

5. Same, I think.

6. None unless of typho-malarial.

8. Diphtheria.

9. Better sanitary measures.

10, 12, and 14. None.

15. I suppose, considering the prevalence of typho-malarial fevers during July to last of October, mortality was "low."

16. Nothing worthy of note, unless the catarrhal diseases or influenza was unusual,—reported as "coughs and colds" and influenza,—and a general malarial type, mild in fevers, except intermittent, which was severe, especially through May.

17. Scarlet fever—Cannot; measles—Cannot; whooping-cough—Cannot; diphtheria—Cannot.

18. Small-pox, cholera, cerebro-spinal meningitis.

19. Possibly scarlet fever slightly.

20. No.

21. *January:* "Colds," bronchitis to middle of month, pneumonia, rheumatism, consumption.
  February: Influenza, intermittent and remittent fevers, consumption, rheumatism, and bronchitis.
  March: Influenza, consumption, also whooping-cough after 15th, rheumatism, pneumonia, capillary bronchitis.
  April: Influenza, bronchitis, and consumption, inflammatory sore throat, last of month, and neuralgia.
  May: First half of month, influenza, and intermittent fever all the month, influenza last half of month, consumption, malarial types last part severe.
  June: Intermittent fever, bronchitis to 20th of month, consumption (order) 3 and 2 during month.
  July: Intermitting fever first to 24th, then second; from July 17th, typho-malarial was first, remittent fever was second; cholera morbus second from 15th, consumption third.
  August: Typho-malarial fever, remittent fever, intermittent fever, 2 and 3, until last of month, dysentery, cholera infantum, consumption.
  September: Dysentery, typho-malarial fever, remittent fever, diarrhea, cholera morbus, consumption, inflammation of brain, inflammation of bowels, and whooping-cough.
  October: Typho-malarial fever, until last of month, remittent fever, intermittent fever, consumption, one case puerperal fever, whooping-cough.
  November: "Coughs and colds," "sore throat," bronchitis, consumption, erysipelas (epizootic in horses).
  December: "Coughs and colds," bronchitis and "sore throat," consumption, rheumatism, some slight ague.

22. Epizootic in horses in November.

27. Good, I think.

32, 33, and 36. Cannot.

42. By a case from Iowa coming here.

43. None.

Northville, Mich. **J. M. SWIFT, M. D.**

REPLIES BY WALTER G. ELLIOTT, M. D., OF PONTIAC, OAKLAND CO., MICH.

1.[†] 4,500.

2. 41.

3. City of Pontiac, 3 by 2 miles, 6 square miles.

4 and 5. About the same.

6. None except small-pox.

7. None.

8. Measles.

9. The lessened number of persons susceptible.

10. None except small-pox.

11, 12, 13, 14, and 15. None.

16. Small-pox in December, measles in November and December.

17. Small-pox, 2; scarlet fever, a few; measles, 25.

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[*] For counties included in each division, see Exhibit 1, page 257.

[†] The figures beginning paragraphs refer to questions in Circular 40, printed (in small type) on pages 253-272 of this Report. A summary of the replies is printed on pages 253-272.

18. Cholera, typhoid fever, whooping-cough, cerebro-spinal meningitis, diphtheria.

19. Yes. Measles and scarlet fever.

20. No. Schools were not closed.

21. *January:* Bronchitis, influenza, rheumatism, pneumonia, measles, tonsilitis, neuralgia, fever intermittent, pulmonary consumption.
  February: Bronchitis, influenza, rheumatism, pneumonia, tonsilitis, measles, neuralgia, fever intermittent.
  March, April, May, and *June:* No record.
  July: Fever intermittent, diarrhea, rheumatism, bronchitis, cholera morbus, cholera infantum, erysipelas, pneumonia.
  August: Fever intermittent, diarrhea, cholera morbus, fever remittent, rheumatism, cholera infantum, dysentery, bowels, inflammation of.
  September: Fever intermittent, diarrhea, cholera morbus, cholera infantum, dysentery, fever remittent, rheumatism, pulmonary consumption.
  October: Diarrhea, fever remittent, dysentery, cholera morbus, typho-malarial fever, rheumatism, pulmonary consumption.
  November: Bronchitis, influenza, pneumonia, diarrhea, fever intermittent, measles, neuralgia, rheumatism.
  December: Bronchitis, rheumatism, pneumonia, influenza, tonsilitis, measles, neuralgia, erysipelas, fever intermittent, pulmonary consumption.

22. March, April, and May a disease prevailed among horses, affecting the lungs and air passages. No hog cholera.

23, 24, and 25. No.

26. An excessive amount of rainy weather prevailed in July. Wheat and grass were gathered mouldy.

27. Very damp.

28. Wheat moulded unless more than the usual care was bestowed.

29. No.

30. If threshed early.

31. The late hay was.

32. *January:* Frequent changes; less than the usual degree of cold.
  February: Milder than usual.
  March, April, May, June: Not noted.
  July: Very wet.
  August: Not noted.
  September: Wet.
  October: Not noted.
  November: Nothing unusual except cold latter part of month.
  December: Continuously cold.

33. The season was generally quite moist. Not noted except the month of July.

34. Cannot say.

35. July.

36. Jan., 2 to 15 ft.; Feb., March, April, May, and June, same; July, slight increase; Aug., Sept., Oct., Nov., and Dec., same as usual.

37. Varies 10 to 60 or 90 feet.

38. The variations are so great in different localities it is not possible to answer.

39. July.

40. None.

41. In some cases scarlet fever has been communicated by clothing.

42. By persons visiting patients conveying it in their clothes.

43. None.

Pontiac, Mich. WALTER G. ELLIOTT, M. D.

REPLIES BY J. P. WILSON, M. D., OF PONTIAC, OAKLAND CO., MICH.

1. 4,500.

2. 41 by actual returns.

3. City of Pontiac and a circuit of six miles around.

4. Same as average. Our death-rate for many years has been about one per cent.

5. About the same as average—a little less.

6. Measles and malarial fevers.

7. Members of the Board of Health thought it best the measles should prevail.

8. None.

15. Measles, only 2 deaths.

16. Small-pox.

17. Small-pox, 2; scarlet fever, 2 or 3; measles, about 300; whooping-cough, 2 or 3; diphtheria, 2.

18. Cerebro-spinal meningitis, typhoid fever, cholera.

19. Yes. Measles and scarlet fever.

20. Schools have never been closed on account of epidemics here.

21. *January, February, March, and April:* Measles.
  May, June, July, August, and September: Intermittents mainly. Some few remittent fevers.
  October, November, and December: Ordinary catarrhal diseases and rheumatism.

22. Catarrhal influenza among horses to some considerable extent.

23. No.

24 and 25. None.

26. Potatoes and apples rotted more than common, oats rusted, and hay moulded.

27. Rye and oats, fair; corn, good; wheat, damp and to some extent sprouted.

28. Oats were rusted and wheat in low grounds.

29. No.

30. Greater.

31. More.

32. *January, February, March, April, May:* In general terms mild and wet.
  June, July, August, September, October: Heat and moisture higher than average.
  November, December: Cold and dry.

33. Cannot.

35. Cannot give the months, but the season as a whole was a wet one.

37. 25 feet, in places over 60 feet and low as 8 feet.

39. All the year through.

42. Had but a few cases in the year, but absence of isolation and disinfection are the chief causes of extension.

43. I do not know.

Pontiac, Mich. JNO. P. WILSON, M. D.

REPLIES BY E. P. CHRISTIAN, M. D., OF WYANDOTTE, WAYNE CO., MICH.

1. 3,632.

2. From June, 1879, to June, 1880, 55 per census.

3. City of Wyandotte.

4. About an average per capita. Increase 15 per cent.

5. About the same.

6. Membranous croup in fall.

8. Scarlet fever and measles.

10. Croup.

12. Scarlet fever and measles.

14. Membranous croup in fall months.

15. Diphtheria, unless the croup cases were cases of diphtheria, attacking trachea primarily.

16. None.

17. Scarlet fever, 6; typhoid fever, 50; measles, 100; whooping-cough, many; diphtheria, very many; these are estimated from my own practice.

18. Small-pox, cholera, cerebro-spinal meningitis.

19. Yes, measles, scarlet fever, and diphtheria. Possibly also typhoid fever.

20. Not particularly. In a compact community the only difference is that the epidemic sooner runs out by the agency of schools.

21. *January:* Bronchitis, measles, pneumonia, typhoid fever, influenza.
  February: Measles, influenza, pneumonia, rheumatism, intermittent fever, typhoid fever, diphtheria.
  March: Measles, bronchitis, rheumatism, influenza, intermittent fever, typhoid fever.
  April: Diarrhea, pneumonia, intermittent fever, rheumatism.

May: Intermittent fever, diarrhea, scarlatina, pneumonia, rheumatism.
June: Intermittent fever, diarrhea, cholera morbus, pneumonia, scarlatina, rheumatism, typhoid fever.
July: Diarrhea, intermittent fever, remittent fever, cholera morbus, cholera infantum, bronchitis, typhoid fever, rheumatism, measles.
August: Intermittent and remittent fevers, diarrhea, cholera infantum, cholera morbus, typhoid fever.
September: Intermittent fever, diarrhea, remittent fever, typho-malarial and typhoid fevers, diphtheria.
October: Diphtheria, intermittent and remittent fevers, diarrhea, typhoid and typho-malarial fevers, bronchitis, cholera morbus.
November: Diphtheria, bronchitis, typhoid, intermittent, and remittent fevers.
December: Bronchitis, typhoid fever, diphtheria, croup.

22.* Epidemic influenza, so called epizootic, among horses throughout summer and fall.

In regard to questions from 25 onward, it will be impossible for me to give answers of any value from want of data to which to refer. The general crops were gathered in good condition. No epidemics among animals except as referred to among horses. Soil moisture about an average.

Wyandotte, Mich. E. P. CHRISTIAN, M. D.

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* The figures beginning paragraphs refer to questions in Circular 40, printed (in small type) on pages 253-272 of this Report. A summary of the replies is printed on pages 253-272.

PREVENTION AND RESTRICTION OF SMALL-POX.

DOCUMENT ISSUED BY THE MICHIGAN STATE BOARD OF HEALTH.
[54.]

PREVENTION OF SMALL-POX.

1. **Small-pox a preventable disease.**—It has long been known that small-pox can be prevented or modified by vaccination. It is now believed that a wide-spread epidemic of the disease can be attributed only to an equally wide-spread ignorance or willfulness concerning small-pox and its prevention by vaccination. No intelligent person need have small-pox.

2. **Why vaccinate.**—Because unmodified small-pox is so deadly a disease, and so often disfigures and enfeebles those who recover,* and because by traveling or by travelers, by articles received in the mail or from stores or shops, or in various other ways any one at any time may without knowing it be exposed to small-pox, it becomes important so far as possible without injury to health to render every person incapable of taking the disease. This may be done so perfectly by vaccination and revaccination with genuine bovine vaccine virus that no question of ordinary expense or trouble should be allowed for a day to prevent the careful vaccination of every man, woman, and child in Michigan, and the revaccination of every one who has not been vaccinated within five years. It is well established that those who have been properly vaccinated are far less likely to take small-pox if exposed to it, and that the very few who have been properly vaccinated and have small-pox have it in a much milder form and are much less disfigured by it than those who have not been thus vaccinated. The value of vaccination is illustrated by the following facts:—

On March 13, 1859, Dr. E. M. Snow, of Providence, R. I., found, in a cluster of seven houses, twenty-five families, and in these families ten cases of small-pox, all apparently at about the same stage of the disease. In the same families there were twenty-one children who had never been vaccinated. The ten cases and the remaining members of the families including the twenty-one children were quarantined at home, and the children were all vaccinated and compelled to remain with the sick. Several other cases of small-pox occurred in persons previously exposed, but not one of the twenty-one children referred to had the slightest touch of the disease.

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* "Among those who outlive it, many either totally or partially lose their sight or hearing; many are left consumptive, weakly, sickly, or maimed; many are disfigured for life by horrid scars, and become shocking objects to those who approach them. Immense numbers lose their eyesight by it."—*La Condamine.*

In Sweden the average number of deaths in each year from small-pox per one million inhabitants was,—

Before the introduction of vaccination (1774–1801), 1,973.

During the period of optional vaccination (1802–1816), 479;

And during the period of obligatory vaccination (1817–1877), 189.

Vaccination was introduced in England near the beginning of the present century, and since 1853 compulsory vaccination has been attempted. In England the number of deaths in each year from small-pox per one million inhabitants was,—

At the close of the last century, 3,000;

From 1841 to 1853 (average), 304;

From 1854 to 1863 (average), 171.

In the Bavarian army revaccination has been compulsory since 1843. From that date till 1857, not even a single case of unmodified small-pox occurred, nor a single death from small-pox.

During 42 years of duty, Dr. Marson, physician of the London small-pox hospital, has never observed a single case of small-pox in the officers and employees of the hospital, who are revaccinated when they enter the service, and who are constantly exposed to the infection.

"Out of more than 10,000 children vaccinated at Brussels with animal lymph, from 1865 to 1870, and who went through the terrible epidemic of small-pox which in 1870 and 1871 frightened the world, not a single one was, to my knowledge, reported as being attacked by the disease. The same immunity was shared by those—a much larger number—whom I had revaccinated, and who at the same time were living in epidemic centers."—Dr. Warlemont, of Brussels.—[North Carolina Medical Journal, January, 1880. Vol. v., p. 2.]

3. **Who should be vaccinated.**—Everybody, old and young, for his own interest and that he may not become a breeding-place for the distribution of small-pox to others, should seek that protection from small-pox which is afforded by vaccination alone. It is believed that all persons except those mentioned in the following paragraph may, if the operation is properly performed, at the proper time, and with pure bovine virus, be vaccinated with perfect safety to themselves. Even those who have had small-pox should be vaccinated, for otherwise they may take the disease; and it seems to be proved that a larger proportion of those who have small-pox a second time die than of those who have the disease after vaccination.

4. **Who should not be vaccinated.**—Unless exposure to small-pox is believed to have taken place, or likely to take place, teething children, pregnant women, persons suffering with measles, scarlet fever, erysipelas, or susceptible to and recently exposed to one of these diseases, persons suffering with skin disease or eruption, and in general feeble persons not in good health, should not be vaccinated. In all cases in which there is any doubt as to the propriety of vaccinating or postponing vaccination, the judgment of a good physician should be taken. The restriction as to vaccinating teething children makes it important that children should be vaccinated before the teething process has begun, because small-pox is very much more dangerous than vaccination. Small-pox is exceedingly dangerous to pregnant women.

5. **When should a person be vaccinated.**—The sooner the better, as a rule, and especially whenever there is much liability of exposure to small-pox. Children should be vaccinated before they are four months old; those who have never been vaccinated, should, with the exceptions previously made, in paragraph 4,

be vaccinated at once. Because the vaccination often loses its protective power after a time, those who have been vaccinated but once or twice should, in order to test and to increase the protective power of the former vaccination, be vaccinated again and as often as the vaccination can be made to work. For the first three or four scars the protection afforded is believed to be somewhat in proportion to the number of good scars, conditioned always that the scars be the result of a proper vaccination with genuine vaccine virus. In general, to insure full protection from small-pox one should be vaccinated as often as every five years. It has been found that of those who have small-pox, the proportion of deaths is very much less among those who have three or four good vaccination scars than among those who have but one scar.

Vaccination as late as the second day after known exposure to small-pox, has prevented the small-pox; vaccination the third day after exposure has been know to render the disease much milder than usual, and, in a recent case in Iowa, vaccination on the seventh or eighth day after exposure to small-pox ran a partial course and was believed to have modified the attack of small-pox, which however, it did not wholly prevent.

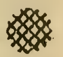
6. **With what should one be vaccinated.**—Virus taken from the arm of one vaccinated a second time is worthless because unreliable. Virus dissolved and carried about between glass slips in the pocket of the vaccinator is liable to contamination and fermentation; bovine virus dried on ivory or quill points is preferable. It should be remembered that a vaccination which does not produce a vaccine vesicle, while it affords but little or no lasting protection against small-pox, may prevent subsequent vaccinations from working well and becoming protective. For this reason it is important to use only virus from reliable sources and free from contamination or decomposition. In a majority of cases, if the virus be taken at the proper time (eighth day after vaccination) from the arm of a healthy child having no taint of a hereditary or communicable disease, such as scrofula, consumption, syphilis, erysipelas, scarlet fever, etc., and undergoing the action of its first vaccination, and if a properly cleaned lancet be used, no harm will result to the person vaccinated, and a good vaccination may be secured. This method involves rupturing the vesicle on the arm of the child from whom the virus is obtained, and this is objectionable because it may interfere with the complete development of its vaccination. But because harm has sometimes resulted from the use of virus taken from another person, because it is often impossible to tell whether a child has pure blood and is free from every disease, because it is so easy to obtain pure and fresh bovine virus, and because such bovine virus is efficient, it is better in all cases to use only the pure and fresh bovine virus.

Reasons for preferring bovine virus to humanized virus may be given as follows:—(1.) By the use of the bovine virus there is secured a more perfect or typical development of the vaccine disease; and hence it may fairly be inferred a greater protection against small-pox. (2.) With the bovine virus and with a clean lancet, and with clean surroundings, there is no danger of communicating syphilis. (3.) The bovine virus is far more effective than the humanized virus in revaccination; and where the humanized virus fails and the bovine virus works it is probable that there was susceptibility to small-pox which the humanized virus did not remove but which has been removed by the bovine virus. (4.) Greater care can be taken in the propagation of bovine virus, a greater supply can be always at command, and always, but especially in times of urgent danger from small-pox people can have a better guarantee that they are vaccinated with genuine and pure vaccine virus.

7. **By whom should one be vaccinated.**—The operation of vaccination should be performed always by a competent and responsible physician, or by some one whom he has instructed and recommends to perform the operation. To try to vaccinate one's self or one's family is poor economy, for it often results not only in a waste of money and of time but in a false and dangerous feeling of security. To trust to vaccination by nurses and midwives is equally foolish. A well-educated and experienced physician has the skill, and the special knowledge necessary to the best judgment on all of the questions involved, without which the operation may be a failure or worse than a failure. In work of this kind the best is the cheapest, whatever it costs.

8. **Where to obtain fresh and pure bovine virus.**—Dr. E. L. Griffin, of Fond du Lac, Wis., by a series of inoculations of young heifers propagates virus of the Belgian stock of cow-pox, obtained from Dr. Warlomont, director of the government vaccine establishment of Brussels. This virus, so far as known, never has passed through the human subject. It is stored on ivory points, each of which holds enough virus to vaccinate one person, and should be used only for one person. Ten points are sent by mail for one dollar; and if used according to the directions of Griffin's circular within ten days of the receipt of the package their efficiency is guaranteed by him. Dr. Henry A. Martin, of 27 Dudley St., Boston, Mass., who claims the honor of being the first propagator of bovine virus in the United States, propagates virus of the Beaugency stock. Both Dr. Griffin and Dr. Martin are believed to be reliable propagators of bovine vaccine virus. By request of the Michigan State Board of Health, Dr. George E. Ranney, of Lansing, Mich., supplies to persons in Michigan ordering through him, the virus propagated by Dr. Griffin, at Dr. Griffin's prices, the money to accompany the order.

9. **Where should vaccination be performed.**—In a room or place free from persons suffering from disease, and from dust or vapors which may convey to the scratched surface germs of any communicable disease; certainly not in or near a room where there is erysipelas, nor in the presence of one who has just come from a person sick with erysipelas, diphtheria, or scarlet fever.

10. **How to vaccinate.**—In remote places it is sometimes necessary to vaccinate persons who are practically beyond the reach of a competent physician. For the benefit of such, and not as an encouragement to others to dispense with the services of a skillful physician, the following suggestions are made as to the best method of vaccinating. As a rule the most convenient place for vaccination is found to be on the outer surface of the left arm, about one-half or two-thirds the way up from the elbow to the shoulder. An infant which its mother carries on her right arm should be vaccinated on its right arm in order to avoid rupturing the vesicle by pressure against its mother. With a sharp-pointed and perfectly clean instrument (lancet) make six parallel scratches, barely sufficient to make a show of blood, but not to cause bleeding. Directly across these scratches make four or five similar scratches, so that the scarified place shall be as large as a split pea, and something like this illustration:  If blood flows, wait, and wipe it off before applying the lymph. The virus is at and near the pointed end of the ivory carrier. Moisten the lymph upon the ivory point with half a drop of pure cool water smeared over it with the lancet. Then *rub the point over the scarified surface briskly for a minute so as to lodge the granules in the abraded surface.* The lymph which may be deposited on the sound skin should be scraped upon the scarified place and allowed to dry there. When the arm is dry return its ordinary clothing,

between which and the arm a loose, soft cloth may be fastened. Do not put on a tight bandage or any plaster. Let no saliva touch the scratched place, neither to affix a plaster nor in any way. When an ivory point has been used throw it in the fire. Except there is urgent necessity, do not use the same point on two persons, and not then if there is danger of communicating disease. Vaccination sometimes fails because the arm is not well scarified and the virus is not thoroughly rubbed into the scarified surface. A skillful vaccinator can generally use sufficient care to insure success in a susceptible person. Never cut entirely through the skin. Virus should not be inserted under the skin. Except with young children, and with feeble persons, for whom only one place is recommended, two or more places an inch or more apart may be scarified and vaccinated.

11. **After vaccination.**—Let the vaccinated place alone. Do not scratch it or otherwise transfer the virus where it is not wanted.

12. **Common appearances after vaccination.**—For a day or two nothing unusual should appear. A few days after that, if it succeeds regularly, the skin will become red, then a pimple will form, and on the pimple a little vesicle or blister which may be plainly seen on the fifth or sixth day. On the eighth day the blister (vesicle) is, or should be, plump, round, translucent, pearly white, with a clearly marked edge, and a depression in the center; the skin around it for about half an inch is red and swollen. This vesicle and the red inflamed *circle* about it (called the areola) are the two points which prove the vaccination to be successful. A rash, and even a vesicular eruption, sometimes comes on the child's body about the eighth day, and lasts about a week; he may be feverish, or may remain quite well. The arm may be red and swollen down as far as the elbow, and in an adult there will usually be a tender or swollen gland in the armpit, and some disturbance of sleep for several nights. The vesicle dries up in a few days more, and a crust forms which becomes of a brownish mahogany color, and falls off from the twentieth to the twenty-fifth day. In some cases the several appearances described above may be delayed a day or two. The crust or scab will leave a well-marked, permanent scar.

13. **Signs of successful revaccination.**—When a person who has been once successfully vaccinated is afterwards revaccinated there sometimes results a vesicle which, as regards its course and that of the attendant areola, cannot be distinguished from the perfect results of a primary vaccination, and this is more likely to occur if bovine virus is used. But often the result is modified by the influence of the previous vaccination, no true vesicle forms, but merely a papular elevation surrounded by an areola; and this result having attained its maximum on or before the fifth day, afterwards quickly declines. Or, if a vesicle forms, its shape is apt to vary from that of the regular vesicle, and its course to be more rapid, so that its maturity is reached on or before the sixth day, its areola declines on or before the eighth day, and the scabbing begins correspondingly early. In either case the areola tends to diffuse itself more widely and less regularly, and with more affection of the areolar tissue than in primary vaccination, while the itching and feverishness may be present much the same as in primary vaccination. When the results of a revaccination are not well-marked, protection should not be presumed unless the same virus is proved to be efficient in a primary vaccination.

14. **What to do during and after vaccination.**—Do nothing to irritate the eruption, do not pull the scab off, when it drops off throw it in the fire. When the eruption is at its height show it to the doctor who performed the

vaccination. If it is satisfactory, ask him for a certificate stating when and by whom you were vaccinated, whether with bovine or humanized lymph, in how many places and with what result at each place. When the arm is healed, if the vaccination did not work *well, be vaccinated again and as soon as possible,* and in the best manner possible. This will be a test of the protection secured by the former vaccination, and will itself afford increased protection. Do not be satisfied with less than four genuine vaccine scars, or with four if it is possible to secure more than four. This vaccination a second or third time in close succession is believed to be hardly less important than vaccination the first time, and hardly less valuable as a protection against small-pox. Without doubt many persons are living in a false sense of security from small-pox because at sometime in their lives they have had a little sore on their arms caused by a supposed or a real vaccination, or because an imperfect vaccination failed to "work," or because they were successfully vaccinated, or had the varioloid, or the unmodified small-pox many years ago. Until small-pox is stamped out throughout the world so that exposure to the disease shall be practically impossible, the only personal safety is in such perfect and frequent vaccination that one need not fear an exposure to small-pox through the recklessness of the foolish. Statistics abundantly prove that among the unvaccinated, small-pox has lost none of the deadly power which made it such a terror to former generations.

15. **Make a record of your vaccination.**—Do not fail to procure and preserve the certificate mentioned in the preceding paragraph, and also to make a personal record of the facts with regard to any vaccination of yourself or in your family. From it you may sometime learn that it is ten years since you or some member of your family was vaccinated, when you thought it only five.

16. **Vaccination before admission to the schools.**—In some places, and with good results, the board of education has made the possession of a certificate signed by some competent physician, stating that the child has been successfully vaccinated within a given number of years or months, a condition to admission to the public schools. Such a regulation seems to be one of the most efficient means of securing a general vaccination of the young people.

17. **Corporations and large business firms** may well prevent interruption of their business by small-pox by requiring employees to exhibit certificates of successful vaccination, and of revaccination.

18. **Do not Delay to be vaccinated.**—By setting about it at once there will be time to secure pure and fresh vaccine virus, and neither sickness nor haste need prevent a successful vaccination. But if one puts it off, he may suddenly be called away on an unexpected journey in which he may incur greater risk of exposure to small-pox, or small-pox may appear in his vicinity and for want of time to procure reliable vaccine virus he may be compelled to accept vaccination with virus neither fresh and active nor of known purity; and vaccination with inferior virus, while it affords but little protection aginst small-pox, may be a hindrance to successful vaccination with the best virus; or by his delay he may contract small-pox itself, with all its dangers and with an expense many times larger than the cost of thorough vaccination.

19. **Small-pox occurs** at all seasons of the year, but as a rule is most prevalent in cold weather. It has been suggested that this may be in part due to a lack of ventilation in winter, by which the poison becomes more concentrated, and to the greater irritation and rawness of the throat and air-passages caused

by the cold, dry air and by the more abundant ozone in winter, the sore throat supplying a place where small-pox may easily be inoculated; it is known also that in a warm, moist air vaccine virus decomposes more readily than in a cold, dry air, and the same is probably true of small-pox virus. This greater liability to small-pox in winter makes it important that one should not wait till winter and its dangers have come before being vaccinated, and also that he should not suffer the winter to pass without being vaccinated.

20. **Small-pox not spontaneously generated.**—It is believed that neither small-pox nor any other strictly contagious disease is originated in Michigan, and that small-pox may in great part be kept out of the State if proper measures are taken, such as the systematic inspection of immigrants and travelers and the isolation and disinfection of all infected material.

21. **Premises.**—Privies, cesspools, waterclosets, drains, gutters, and all other such places liable to receive the contagium of a disease should be frequently and liberally treated with the copperas solution mentioned in paragraph 9, page 297.

22. **Rags.**—No person should handle old clothing or rags without taking precautions to prevent the spread of communicable diseases. Children should not be allowed to go near a rag-gatherer's collection, nor into the rag-rooms in paper-mills or store-houses.

RESTRICTION OF SMALL-POX.

When small-pox appears in a place it is generally possible to restrict it to the first case or set of cases. Five things should immediately be done, and several other things should without fail be done in their proper order, somewhat as follows:—

1. **Notice to the local board of health.**—The house-holder within whose family a case of small-pox occurs, and the physician called to treat a case of small-pox should at once give notice thereof to the health officer (or to the local board of health), as required in townships by sections 1734 and 1735 of the compiled laws of 1871, and in cities and villages by section 1740 of the compiled laws of 1871, as amended in 1879. Sections 1734 and 1735 (sections 43 and 44 of chapter 46), compiled laws of Michigan, 1871, are as follows:—

(1734.) SEC. 43. Whenever any householder shall know that any person within his family is taken sick with the small-pox, *or any other disease dangerous to the public health*, he shall immediately give notice thereof to the Board of Health, or to the Health Officer of the township [city, or village*] in which he resides; and if he shall refuse or neglect to give such notice, he shall forfeit a sum not exceeding one hundred dollars.

Householders to give notice of disease; penalty for neglect.

(1735.) SEC. 44. Whenever any physician shall know that any person whom he is called to visit is infected with the small-pox, *or any other disease dangerous to the public health*, such physician shall immediately give notice thereof to the Board of Health, or Health Officer of the township [city, or village*] in which such diseased person may be; and every physician who shall refuse or neglect to give such notice, shall forfeit, for each offense, a sum not less than fifty nor more than one hundred dollars.

Penalty on physician neglecting to give notice.

Section 1740, as amended by Act No. 145, laws of 1879, is as follows:—

(1740.) SEC. 49. The mayor and aldermen of each incorporated city, and the president and council, or trustees of each incorporated village in this State, in which no board of health is organized under its charter, shall have and exercise all the powers and perform all the duties of a board of health as provided in this chapter, within the limits of the cities or villages, respectively, of which they are such officers. The provisions of this chapter, and the amendments thereto, shall, as far

Board of Health in cities and villages, who to constitute.

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* See section (1740) Sec. 49, as amended by Act No. 115, Laws of 1879, on this and following page.

Duties of officers and inhabitants of cities and villages.

as applicable, apply to all cities and villages in this State, and all duties which are, by the provisions of this chapter, to be performed by the board of health of townships, or by the officers and inhabitants thereof, shall in like manner be performed by the board of health and the officers and inhabitants of such cities and villages, with a like penalty for the non-performance of such duties, excepting in cases where the charters of such cities and villages contain provisions inconsistent herewith.

2. **Vaccination of attendants and all exposed.**—The attendants on the sick with small-pox and all other persons who it is feared have been exposed to small-pox or varioloid, should immediately be vaccinated. If properly vacinated within a day or two after exposure to small-pox, a person has a good chance to escape small-pox entirely, and if he should come down with varioloid or modified small-pox he will probably have the disease in a much milder form than if not recently vaccinated. (See page 291, paragraph 5,—Prevention of Small-pox.) Unless the eruption has already appeared, vaccinate.

3. **Restriction of the Infection.**—As the contagium of small-pox harbors in carpets, bedding, clothing, etc., it is best to prepare the room in which one sick with small-pox is to be cared for, removing the carpets, pictures, sofas, etc., the bedding and clothing not required for actual use in the room, and any other articles capable of harboring the infection and which it would be difficult to disinfect or not desirable to burn. Such removals of carpets, bedding, etc., should not be attempted after they have been exposed to infection, unless properly disinfected under the direction of the health officer. (See paragraphs 12 and 15, page 298, of this document.)

4. **Isolation.**—Those sick with small-pox or suspected small-pox should at once be separated from all other persons except the necessary attendants on the sick.

5. **Care of those exposed to small-pox.**—All persons known to have been exposed to small-pox should at once be vaccinated, and should be, so far as possible, isolated from others until it is known whether they have contracted the disease. This "period of incubation" is usually about twelve or fifteen days.

6. **Notice of infected place.—Placard on house.**—A signboard or large card as a signal of danger, with the words, SMALL-POX printed on it in large plain letters should at once be displayed before a house, and a large card with the words SMALL-POX in large, plain letters should be fastened on the door of a house, in which is a case of small-pox; and without permission of the health officer no person should be allowed to come to the house or go from it.

7. **Who may attend small-pox patients.**—Any person who has recently been successfully vaccinated or revaccinated, or has *recently* had small-pox or varioloid, may attend on small-pox patients with comparative safety to himself, and in most cases with absolute safety so far as relates to danger from small-pox. No person who has been vaccinated or has had varioloid or small-pox more than ten years previously should rely upon such experience for security from small-pox, if exposed by attendance on a person sick with small-pox or varioloid. Such a person should immediately be revaccinated.

"It is now fully established that a typical vaccine scar is not proof of the immunity of the individual from small-pox. We have admitted to the hospital * * * 711 cases of small-pox exhibiting typical cicatrices; of which number 73 proved fatal."—W. M. Welch, M. D., in Philadelphia Health Report, 1872.

There is good statistical support for the common theory that the protective influence of vaccination, varioloid, and small-pox dies out in seven years.

This is now known to be absolutely true for many persons, but there is no one period applicable to all persons, the fact being that while vaccination affords at first almost absolute protection, its influence is gradually worn out. Its protective influence is lost much sooner in some persons than in others, but experience has shown (as in Philadelphia in 1871–2) that many children vaccinated in infancy have varioloid before they are seven years of age, while in some instances one vaccination or one attack of small-pox protects the individual through life. Inasmuch as many persons are known to be susceptible to small-pox or vaccination as often as once in ten years, and as some are susceptible yet more frequently, this State Board of Health has advised revaccination every five years, as the most judicious measure for the prevention of small-pox.

DISINFECTION.*

8. **Disposal of infected material.**—All discharges from a small-pox patient should be received into vessels containing a strong solution of copperas (sulphate of iron), or the zinc-solution mentioned in paragraph 10. In cities where sewers are in use the disinfected discharges may be thrown into the water-closet; in other places they should at once be buried at least 100 feet distant from any well; they should not by any means be thrown into a running stream nor into a cesspool. All cloths, rags, etc., used about the patient should at once be burned, or where that is impracticable should be thrown into a strong zinc-solution. If necessary, discharges from the patient may be received on old cloths which should at once be burned or disinfected and buried. All vessels should be kept clean and disinfected.

Bedding, clothing, etc., should so soon as removed from the patient be burned. If it is too valuable to be destroyed, it should at once be disinfected by boiling in the zinc-solution, by heating in a specially prepared disinfecting-chamber to a temperature of 250° Fahr., or by long exposure in a close room or box to the fumes of burning sulphur, as stated in paragraph 12.

Cotton, linen, flannels, blankets, etc., should be treated with the boiling hot zinc-solution, introducing them piece by piece, securing thorough wetting, and boiling for at least half an hour.

Heavy woolen clothing, silks, furs, stuffed bed-covers, beds, and other articles which cannot be treated with the zinc-solution, should be hung in the room during fumigation, pockets being turned inside out and the whole garment thoroughly exposed. Afterward they should be hung in the open air, beaten and shaken. Pillows, beds, stuffed mattresses, upholstered furniture, etc., should be cut open, the contents spread out and thoroughly fumigated. Carpets are best fumigated on the floor, but should afterward be removed to the open air and thoroughly beaten, after which they may well be again exposed to fumes of burning sulphur.

9. **The copperas-solution** may be prepared by dissolving sulphate of iron (copperas) in water in the proportion of one and a half pounds of copperas to a gallon of water. When much is wanted it may be prepared by hanging a basket containing about sixty pounds of copperas in a barrel of water.

10. **The zinc-solution** may be prepared by dissolving sulphate of zinc and common salt in water in the proportion of four ounces of zinc-sulphate and two ounces of salt to a gallon of water.

11. **Care of rooms, etc., during sickness.**—So far as consistent with the welfare of the patient, the room throughout the sickness should be constantly ventilated and frequently aired. To confine the poison in a close room is to retain its power of infecting others. It is well to provide for disinfecting the foul air withdrawn from the room, as by an open fire-place where this is practicable,

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* These methods of disinfection are applicable in other contagious diseases, such as scarlet fever, diphtheria, etc. For the statement of some of the methods herein described the State Board of Health is indebted to a circular on disinfection (No. 8) issued by the National Board of Health.

or by flues leading into furnaces, or kept constantly fumigated in some manner. It is well to keep in the sick-room a vessel containing the zinc-solution (mentioned in a preceding paragraph) for the reception of towels, sheets, and other articles of clothing which are not to be burned or disinfected in a specially prepared oven.

12. **Disinfection after death, recovery, or removal.**—After death, recovery, or removal there should take place, under the supervision of the health officer, the most thorough and complete disinfection of the house and the contents of the house in which there has been a case of small-pox. It is far better for the community and cheaper for the board of health to pay a competent man to see that this is properly done than to take the risk of its not being done well. This disinfection should be done with fumes of burning sulphur. For this purpose the room to be disinfected must be vacated. Heavy clothing, blankets, bedding, and other articles which cannot be treated with zinc-solution, should be opened and spread out so as to be freely exposed during fumigation. Close the doors and all large openings to the room as tight as possible, but do not use paste, or in any such way cover surfaces which need to be disinfected, nor prevent free entrance of the fumes to all cracks into which the contagium may have entered. Place the sulphur in iron pans supported upon bricks, set it on fire by hot coals or with the aid of a spoonful of alcohol and a lighted match, and allow the rooms to remain closed for several hours. For a room about ten feet square, two pounds of sulphur should be burned; for a larger room a proportionally larger quantity should be used, that is at the rate of one and a half to two pounds of sulphur to each one thousand cubic feet of air-space.

13. **Carefully avoid breathing the fumes of the burning sulphur.**—After fumigation for several hours, the room should be thoroughly opened and aired, before it is again occupied.

14. **Care of the corpse.**—The corpse should be wrapped in a sheet wet with a zinc-solution of double the strength specified in paragraph 10, page 297, and buried at once. Metallic, metal-lined, or air-tight coffins should be used when possible, certainly when the body is to be transported for any considerable distance. In no case should the body be exposed to view except in a perfectly air-tight coffin, and through glass; the coffin after its final closure having been exposed to fumes of burning sulphur.

15. **Disinfection of rooms, clothing, etc., incidentally exposed to infection.**—Hotel-rooms, stores,[*] cars, boats, hacks or other enclosures which may have been exposed to infection should be carefully disinfected by fumes of burning sulphur, as specified in paragraph 12.

16. **Funerals.**—No public funeral should be held at the house, and no one should go to a public funeral from the house where one has died from small-pox, or the inmates have been exposed to the disease. Should any one from an infected or exposed house ride to a funeral or a grave in a public hack the robes, cushions, etc., and the interior of the hack should immediately afterwards be thoroughly disinfected by exposure for several hours to the fumes of burning sulphur, as described in paragraph 12.

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[*] Prof. Richardson, of Philadelphia, says:—(Germ Theory of Disease, *Trans. Phila. Social Science Association, Penn Monthly, Nov., 1878.*) Some years ago cases of small-pox occurred in the house of a dealer in ready-made clothing near New York. The whole stock of coats, pantaloons, etc., numbering many hundreds, had an opportunity to become infected and should have been carefully disinfected. They were, however, sold at retail, and may have given rise to many cases of "idiopathic" small-pox which no one could trace to any source of contagium.

17. **Care of convalescents.**—After recovery the patient should not be allowed to go abroad or to receive visitors until his clothing, etc., has been carefully disinfected under the supervision of the health officer, and until he has received from the health officer or from some competent physician a properly authenticated statement which is approved by the health officer that there is no longer any danger of his communicating the disease.

18. **Hospitals for persons sick with diseases dangerous to the public health.**—As a means of preventing the spread of disease, the law authorizes the inhabitants of townships, cities, and villages to be constantly provided with hospitals for the reception of persons having small-pox, or any other disease dangerous to the public health; and directs local boards of health on the outbreak of any such disease to provide such hospitals or places of reception for the sick and infected as they shall judge best for their accommodation and the safety of the inhabitants, and to cause such sick or infected persons, if their condition will admit, to be removed to such hospitals or places of reception,—said hospitals, and (in case the sick cannot be removed to the hospital without danger to life or health) the houses where the sick may remain, and all persons connected with said hospitals or abodes of the sick to be subject to the regulations of the board of health, or of a committee appointed by the board of health for that purpose. Sections 1726–1733 of the Compiled Laws of 1871, relating to this subject, and by amended section 1740 (being Secs. 35–42, and 49 of chapter XLVI.) made equally applicable to cities, villages, and townships, are as follows:

(1726.) SEC. 35. The inhabitants of any township may establish within their township and be constantly provided with one or more hospitals for the reception of persons having the small-pox, or other disease which may be dangerous to the public health. Hospitals for reception of persons having small-pox, etc.

(1727.) SEC. 36. All such hospitals shall be subject to the orders and regulations of the board of health, or a committee appointed by such board for that purpose; but no such hospital shall be established within one hundred rods of any inhabited dwelling-house situated in an adjoining township, without the consent of such adjoining township. By whom hospitals to be regulated, etc.

(1728.) SEC. 37. If any person shall inoculate any other person, or inoculate himself, or suffer himself to be inoculated, with the small-pox, unless at some hospital licensed and authorized by law, he shall, for each offense, forfeit a sum not exceeding two hundred dollars. Penalty for inoculating with small-pox, except at hospitals.

(1729.) SEC. 38. When any hospital shall be so established, the physician attending the same, the persons inoculated or sick therein, the nurses, attendants, and all persons who shall approach or come within the limits of the same, and all such furniture and other articles as shall be used or brought there shall be subject to such regulations as shall be made by the board of health, or of the committee appointed for that purpose. Physicians, etc., to be subject to regulations of board, etc.

(1730.) SEC. 39. When the small-pox or any other disease dangerous to the public health shall break out in any township, the board of health shall immediately provide such hospital, or place of reception for the sick and infected, as they shall judge best for their accommodation and the safety of the inhabitants; and such hospitals and places of reception shall be subject to the regulations of the board of health, in the same manner as hereinbefore provided for established hospitals. When board of health to provide hospital.

(1733.) SEC. 42. If any physician or other person in any of the hospitals or places of reception before mentioned, or who shall attend, approach, or be concerned with the same, shall violate any of the regulations lawfully made in relation thereto, either with respect to himself, or his or any other person's property, the person so offending shall, for each offense, forfeit a sum not less than ten nor more than one hundred dollars. Penalty for violating regulations of hospitals.

19. **Hospital construction, ventilation, warming, etc.**—In the construction and management of hospitals great care should be had for the comfort, safety, and health of those confined in or connected with them, as well as for the safety of the public.

The proper size and plan for such a hospital may vary somewhat for different localities; but a few general principles which should be considered may be mentioned here. Particular attention should be paid to ventilation. The foul air should be drawn off through an opening or openings in the floor or in the wall at the floor-level, into a *heated* flue open at the top. In cold weather the fresh air should be warmed before it enters, or as it enters the room. This may be done by a furnace or by steam coils in fresh air ducts. If stoves are used, this can be done by jacketing the stove and providing an inlet pipe for fresh air from out door to the back of the stove within the sheet-iron jacket, as described on pages 55–62 of the Report of the State Board of Health for 1879, and on pages 263–6 of the Report for 1880.

20. **Removal of sick or infected persons.**—The law provides that the board of health "shall make effectual provision in the manner in which they shall judge best for the safety of the inhabitants," sections 1706, 1731, and 1707, compiled laws of 1871, being as follows:—

Board to make provision to prevent spread of small-pox, etc.

(1706.) SEC. 15. When any person coming from abroad or residing in any township within this State, shall be infected, or shall lately before have been infected, with the small-pox, or other sickness dangerous to the public health, the board of health of the township where such person may be shall make effectual provision in the manner in which they shall judge best for the safety of the inhabitants, by removing such sick or infected person to a separate house, if it can be done without danger to his health, and by providing nurses and other assistance and necessaries, which shall be at the charge of the person himself, his parents, or other person who may be liable for his support, if able; otherwise, at the charge of the county to which he belongs. 3 Mich. Rep. 475.

When infected persons to be removed to hospital, etc.

(1731.) SEC. 40. The board of health shall cause such sick or infected persons to be removed to such hospitals or places of reception, unless the condition of the sick person be such as not to admit of removal without danger to life; in which case the house or place where the sick shall remain shall be considered as a hospital to every purpose before mentioned, and all persons residing in or in any way concerned with the same, shall be subject to the regulations of the board of health, as before provided.

Provision in case infected persons cannot be removed.

(1707.) SEC. 16. If any such infected person cannot be removed without danger to his health, the board of health shall make provision for him as directed in the preceding section, in the house in which he may be, and in such case they may cause the persons in the neighborhood to be removed, and may take such other measures as they may deem necessary for the safety of the inhabitants.

21. **Nurses and necessary supplies.**—Persons thus restrained at hospital or at home should be permitted to provide themselves, or the local board of health should provide them, with the best nursing and medical care. The duty of the board of health is not primarily to assume the care and medical treatment of the person sick with small-pox or other disease dangerous to the public health, but to place that care and treatment under such regulations as will protect the community from the spread of the disease; but persons thus restrained for the public good are generally prevented from earning their own support, and the public in thus enforcing unusual conditions is bound to provide proper care and medical treatment, food, etc., for those not able to provide for themselves. The board of health is authorized and required to "provide nurses and other assistance and necessaries," at the charge of the person sick, or of those liable for his support, if able (in which case the sick person will choose his own medical attendants), otherwise at the charge of the county to which he belongs. This is provided for by sections 1706 and 1707, compiled laws of 1871, printed above. See also Third Michigan Report, page 475, in which the supreme court in 1855 granted a writ of mandamus to compel the board of supervisors of Macomb county to pay a claim for *care* of an indigent person sick with small-pox, which claim had been audited by, and was for services ordered by,

the board of health of the village of Mt. Clemens, under section 1706, being section 15 of chapter XLVI. of the revised statutes of 1846.

22. **Houses, supplies, nurses, etc., paid by the county in certain cases.**—Nurses and attendants employed by the sheriff or other officer in accordance with section 1709, owners of houses, stores, lodgings, or other necessaries taken possession of by either of said officers in accordance with sections 1709–1712, and other persons properly employed by said officers to assist in the duties enjoined by said sections, are entitled to just compensation, to be paid by the county. This is provided by section 1714, as follows:

(1714.) SEC. 23. Whenever the sheriff or other officer shall take possession of any houses, stores, lodgings, or other necessaries, or shall employ any nurse or attendants, as provided in this chapter, the several parties interested shall be entitled to a just compensation therefor, to be paid by the county in which such person or property shall have been so employed or taken possession of.

Compensation for houses, nurses, etc.

23. **Duties of the local board of health.**—In view of known means of preventing and restricting small-pox, it would seem to be the duty of the local board of health:—

(I.) Frequently to offer free vaccination at any time to all persons who have not been successfully vaccinated within the preceding five years; and constantly to place before the people the importance of vaccination. This the board of health is authorized to do by Act No. 146 of the laws of 1879, which reads as follows:—

SECTION 1. *The People of the State of Michigan enact*, That the board of health in each city, village, and township may, at any time, direct its health officer or health physician to offer vaccination with bovine vaccine virus to every child not previously vaccinated, and to all other persons who have not been vaccinated within the preceding five years, without cost to the persons [person] vaccinated, but at the expense of such city, village, or township, as the case may be.

Board of Health authorized to furnish vaccination.

(II.) To enforce the law (sections 1734 and 1735, compiled laws of 1871, p. 295 of this document), requiring householders and physicians to give immediate notice of cases of small-pox and other diseases dangerous to the public health. What it is the duty of the board of health to require the people to do for their own safety *it is the duty of the people* to do without compulsion. The board of health should have as prompt notice of the outbreak of a contagious disease as the fire department has of the outbreak of fire, and as hearty coöperation of citizens for the suppression of the disease as is given the fire department for the suppression of fire. And when the board is informed it should act as promptly, and continue to act as faithfully, as is done for the extinguishing of a fire.

(III.) To secure complete isolation of those sick or infected with small-pox.

(IV.) To give the public prompt and full notice of infected places (section 1732, compiled laws 1871, printed below.)

(V.) In general, and in compliance with the following section of law, to do all that may be done by prompt and intelligent action to prevent the introduction of disease.

(1732.) SEC. 41. When the small-pox, or *any other disease dangerous to the public health*, is found to exist in any township [city or village*] *the board of health shall use all possible care to prevent the spreading of the infection*, and to *give public notice of infected places* to travelers, by such means as in their judgment shall be most effectual for the common safety.

Notice of infected places.

(VI.) To secure and superintend the immediate and thorough disinfection of infected houses, material, etc., as directed in paragraphs 8–15, pages 297–8 of this document.

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* See Sec. 1740, compiled laws of 1871, as amended by act No. 145, laws of 1879, printed on pages 295–6 of this document.

(VII.) Promptly to notify, by its clerk or health officer, the State Board of Health upon the first outbreak of small-pox, or any other disease dangerous to the public health, in accordance with published requirements of the State Board of Health under section 8 of Act No. 81, laws of 1873.

24. **Board of health should instruct its health officer.**—In order that no time may be lost, it is the duty of every board of health to make provision for prompt action by its health officer, authorizing and directing him to be prepared at all times, as executive officer of the board, to take certain action without waiting for a meeting of the board, whenever a case of small-pox or other disease dangerous to the public health occurs within its jurisdiction. Some of these duties which the health officer should be directed to perform may be briefly suggested as follows:—

He should—

a. Promptly verify the reports of cases of small-pox, and investigate suspected cases which are not reported, so that he may act intelligently.

b. Secure the isolation of those sick with or exposed to small-pox.

c. See that no person suffers for lack of nurses, etc., because of isolation for the public good.

d. In case of an outbreak of small-pox, secure a prompt vaccination of all persons who have been or may be exposed to the disease.

e. Give public notice of infected places. (See paragraph 6, page 296, also Sec. 1732, compiled laws 1871, page 301.)

f. Regulate funerals of persons dead from small-pox, etc.

g. Disinfect rooms, clothing, and premises.

h. Give certificates of recovery and of freedom from liability to communicate the disease.

i. Keep his own board of health, and the State Board of Health, constantly informed respecting every outbreak of a disease dangerous to the public health. (See paragraph (vii.) above.)

25. **Notices of regulations of local boards of health.**—Though a more general notice than is *required* by law should always be given of regulations made by local boards of health, the notice required by section 1698, compiled laws of 1871, should never be omitted, as on the giving of this notice might depend the success of legal proceedings begun by the board to enforce obedience to its regulations:

Notice of regulations, how published.

(1698.) SEC. 7. Notice shall be given by the board of health of all regulations made by them, by publishing the same in some newspaper of the township, if there be one published therein, and if not, then by posting them up in five public places in such township; and such notice of said regulations shall be deemed legal notice to all persons.

Section 1698 applies also to boards of health in cities and villages; and in general it should be remembered that by the amended section 1740 the provisions of all sections in chapter 46 of the compiled laws of 1871, including sections 1692–1744 and the amendments thereto, apply so as far applicable with equal obligation to the inhabitants and the boards of health in cities and villages, unless charter provisions conflict. (See Sec. 1740 in paragraph 1, page 295 of this document.)

26. **Inspection of travelers, restraint of infected persons.**—Boards of health of townships, cities, and villages near to or bordering upon neighboring States are by section 1708 (made applicable to cities and villages by Act 145, laws of 1879) authorized to inspect travelers, and to restrain from travel within their jurisdiction, except by license from the board of health, persons coming from infected places in other States. Section 1708 is as follows:

(1708.) SEC. 17. The board of health of any township near to or bordering upon either of the neighboring States, may appoint, by writing under their hands, suitable persons to attend any places by which travelers may pass from infected places in other States; and the persons so appointed may examine such passengers as they may suspect of bringing with them any infection which may be dangerous to the public health, and, if need be, may restrain them from traveling until licensed thereto by the board of health of the township to which such persons may come; and any person coming from such infected place, who shall, without license as aforesaid, travel within this State, unless it be to travel by the most direct way to the State from whence he came, after he shall be cautioned to depart by the persons appointed as aforesaid, shall forfeit a sum not exceeding one hundred dollars.

Board may restrain travelers coming from infected districts.

27. **Permits for removal** of an infected article or sick person may be granted by the board of health in its discretion.

(1705.) SEC. 14. The board of health may grant permits for the removal of any nuisance, infected article, or sick person within the limits of their township, when they shall think it safe and proper so to do.

Board may permit removal of infected articles, etc.

28. **Restraint and removal of infected persons.**—In case of travelers and other persons *infected* with any disease dangerous to the public health, the law (section 1706 compiled laws of 1871,—see paragraph 20, page 300, of this document) requires the local board of health to make effectual provision for the safety of the inhabitants, including removal to another house when this can be done without danger to the health of the person sick, otherwise at the house where he may be.

In removing and caring for any person infected with contagious sickness the board of health may make use of the sheriff or any constable of the county, by procuring a warrant signed by any two justices of the peace. Section 1709 permits this, and is as follows:

(1709.) SEC. 18. Any two justices of the peace may, if need be, may make out a warrant under their hands, directed to the sheriff or any constable of the county, requiring him, under the direction of the board of health to remove any person infected with contagious sickness, or to take possession of convenient houses and lodgings, and to provide nurses, attendants, and other necessaries for the accommodation, safety, and relief of the sick.

Removal of persons infected.

29. **Control of infected baggage, clothing, goods, etc.**—By sections 1710–1713 the board of health is authorized to procure the detention, examination, and purification at the owner's expense of any baggage, clothing, or goods of any kind, found within the township, city, or village, which there is just cause to suspect to be infected with any disease dangerous to the public health. These sections are as follows:

(1710.) SEC. 19. Whenever on application of the board of health, it shall be made to appear to any justice of the peace that there is just cause to suspect that any baggage, clothing, or goods of any kind found within the township are infected with any disease which may be dangerous to the public health, such justice of the peace shall, by warrant under his hand, directed to the sheriff or any constable of the county, require him to take with him as many men as the said justice shall deem necessary to secure such baggage, clothing, or other goods, and to post said men as a guard over the house or place where such baggage, clothing, or other goods shall be lodged, which guard shall take effectual care to prevent any person removing or coming near to such baggage, clothing or other goods, until due inquiry be made into the circumstances thereof.

Infected baggage, clothing, and goods, how secured.

(1711.) SEC. 20. The said justice may also, by the same warrant, if it shall appear to him necessary, require the said officer, under the direction of the board of health, to impress and take up convenient houses or stores for the safe keeping of such baggage, clothing, or other goods; and the board of health may cause them to be removed to such houses or stores, or to be otherwise detained, until they shall, in the opinion of said board of health, be freed from infection.

Impressing houses, etc., for keeping infected goods.

(1712.) SEC. 21. Such officer in the execution of such warrant, shall, if need be, break open any house, shop, or any other place mentioned in said warrant, where such baggage, clothing, or other goods shall be; and he may require such aid as

Power of officer executing warrant.

shall be necessary to effect the execution of the warrant; and all persons shall, at the command of any such officer, under a penalty not exceeding ten dollars, assist in the execution of the warrant, if able to do so.

Charges to be paid by owner.

(1713.) SEC. 22. The charges of securing such baggage, clothing, or other goods, and of transporting and purifying the same, shall be paid by the owners thereof, at such rates and prices as shall be determined by the board of health.

30. Small-pox in a jail.—The board of health may by written order secure the removal from a common jail to a hospital or other place of safety of a prisoner attacked with a disease dangerous to the safety and health of the other prisoners or of the inhabitants of the township, city, or village. Sections 1715 and 1716 authorizing and prescribing the manner of such removal are as follows:

When prisoners attacked with dangerous disease may be removed.

(1715.) SEC. 24. Whenever any person confined in any common jail shall be attacked with any disease, which, in the opinion of the physician of the board of health, or of such other physicians as they may consult, shall be considered dangerous to the safety and health of the other prisoners, or of the inhabitants of the township, the board of health shall, by their order in writing, direct the removal of such person to some hospital or other place of safety, there to be provided for and securely kept, so as to prevent his escape, until their further orders; and if such prisoner shall recover from the disease, he shall be returned to such jail.

Prisoners removed, to be returned, and not to be considered as having escaped.

(1716.) SEC. 25. If the person so removed shall have been committed by order of any court, or under any judicial process, the order for his removal, or a copy thereof, attested by the presiding member of said board of health, shall be returned by him, with the doings thereon, into the office of the clerk of the circuit court for the county; and no prisoner, removed as aforesaid, shall be considered as thereby having committed an escape.

31. Small-pox in a poorhouse.—On the outbreak in a county poorhouse or in the vicinity thereof of any pestilence or contagious disease likely to endanger the health of persons supported at the poorhouse, the superintendents are by section 1717 required to remove to some other suitable place any or all of the persons there supported until they can safely be returned or otherwise be discharged. Section 1717 is as follows:

When superintendents of poor may remove paupers from poorhouses.

(1717.) SEC. 26. Whenever any pestilence or contagious disease shall break out in any county poorhouse in this State, or in the vicinity thereof, and the physician to such county poorhouse, or such other physician as the superintendents may consult, shall certify that such pestilence or disease is likely to endanger the health of the persons supported at such poorhouse, the superintendents of such county poorhouse shall cause the persons there supported, or any of them, to be removed to some other suitable place in the same county, there to be maintained and provided for at the expense of the county, with all necessary medical attendance and care, until they can safely be returned to such poorhouse, or otherwise discharged.

In July, 1877, the Michigan State Board of Health passed a resolution advising and requesting all boards of health to offer every year free vaccinaton with bovine virus to every child not previously vaccinated and to all other persons not vaccinated within five years. The resolution was then, and has since been widely distributed throughout the State. This tract more fully sets forth the importance of vaccination, and other means for the prevention and restriction of small-pox.

It is hoped that local boards of health, newspapers, and all public-spirited persons will aid in spreading the information herein contained. It is recommended that every local board of health secure copies of this tract, and place one copy in every household within its jurisdiction. Although large numbers are distributed by the State Board of Health, its distribution will not reach every household, but to facilitate this the State Board has secured electrotype plates of this tract; in English, from which copies can cheaply be reprinted. Copies of this tract may be had of W. S. George & Co., Lansing, Michigan, at the following terms, cash to accompany order:

100 copies for	$3 00	400 copies for	$7 00
200 " "	4 50	500 " "	8 00
300 " "	6 00	1,000 " "	14 00

A copy of this document may be obtained by any person in Michigan by addressing the Secretary of the State Board of Health, Lansing, Michigan.

WEEKLY REPORTS OF DISEASES IN MICHIGAN DURING THE YEAR 1880.

A REPORT BASED ON A COMPILATION OF WEEKLY REPORTS FROM HEALTH OFFICERS OF CITIES AND FROM REGULAR CORRESPONDENTS OF THE STATE BOARD OF HEALTH.—PREPARED IN THE OFFICE OF THE SECRETARY OF THE BOARD.

Since the first of September, 1876, weekly reports of diseases present in various parts of the State have been received by the State Board of Health from health officers of cities and from regular correspondents of the Board. Summaries made from these reports have been published in the Annual Reports of the Board for the years 1876, 1877, 1878, 1879, and 1880. This paper continues the subject, and contains a summary for the calendar year 1880, or for the 52 weeks ending with Saturday, Jan. 1, 1881.

At first the names of but 19 diseases were printed on the blanks for reports. Reports are now regularly received concerning 26 diseases, the following-named diseases having been at different times added to the blanks: Pulmonary consumption, remittent fever, typho-malarial fever, neuralgia, tonsilitis, inflammation of brain, and inflammation of bowels. Observers are also asked to add reports concerning any important disease which may occur, the name of which is not printed on the blank.

PLAN OF THE REPORTS.

The method of securing and the plan of marking these reports may be thus stated:—

> The blanks for the weekly reports upon which this compilation is based are printed on postal cards, which are supplied to such regular Correspondents of the Board as consent to make reports, and to the Health Officers of all cities for which a return of the name of a Health Officer has been received. Blank record-books, in which to preserve copies of the reports, together with comments, etc., are also supplied to these Observers of Diseases, to be retained by them. The reports are forwarded weekly to the Secretary of the State Board, at Lansing.
>
> The plan of making the report is as follows: Each observer to mark the disease of which there was the greatest number of cases during the week for which the report is made, 1; that of which there was the next greatest number of cases, 2; the next 3, and so on, applying *consecutive* numbers to the diseases reported present, but marking with the *same* figure all diseases of which there is the same number of cases; to write 0 opposite each disease mentioned of which there was no case; to apply these numbers without regard to severity of the cases; to include all cases, without regard to when they were taken sick, so long as they are actually sick with the given disease; to include

all cases within the knowledge or reasonable belief of the observer, without regard to who may have charge of them; to indicate the severity of the diseases reported, by the signs =, +, and —, denoting respectively that a disease was usually severe, more than usually, or less than usually severe. It has not seemed best to ask for an exact statement of the number of cases, though a blank is left for that purpose, on the margin of the card, for the convenience of those observers who prefer to state the number of cases rather than the order of prevalence by the foregoing method.

To illustrate the method of making the reports the following copy of one of the blanks now in use is given, correctly marked, in the "prevalence" column, for the number of cases stated on the right-hand margin. It should be remembered that the numbers in the "prevalence" column denote simply the relative order in which the several diseases appear to be prevalent, and do not denote a definite number of cases; so that a disease might one week be marked *4* and the following week, with the same number of cases, be marked *1*. Names of diseases and figures printed in italics are not *printed* on the postal blanks, but are supposed to have been *written* on the report by the observer.

Diseases in ....,
☞ [Please Date.]
week ending Sat., ..., *188*.....

No.........		Prevalence. Order. See a.	Severity. See b.	*Cases.*
Ed. 17.	Brain, Inflammation of......	*14*	+	*1*
	Bowels, Inflammation of....	*12*	—	*3*
	Bronchitis.....................	*11*	=	*4*
	Cerebro-spinal Meningitis.	*0*	....	*0*
	Cholera Infantum..........	*8*	—	*9*
	Cholera Morbus.............	*10*	+	*6*
	Consumption, Pulmonary..	*10*	—	*6*
	Croup, Membranous........	*12*	+	*3*
	Diphtheria....................	*5*	=	*14*
	Diarrhea.......................	*3*	=	*17*
	Dysentery.....................	*8*	+	*9*
	Erysipelas.....................	*13*	=	*2*
	Fever, Intermittent.........	*2*	+	*21*
	Fever, Remittent............	*11*	=	*4*
	Fever, Typhoid (Enteric)..	*0*	....	*0*
	Fever, Typho-malarial......	*9*	+	*7*
	Influenza......................	*7*	—	*11*
	Measles........................	*1*	=	*27*
	Neuralgia.....................	*14*	+	*1*
	Pneumonia....................	*9*	=	*7*
	Puerperal Fever.............	*0*	....	*0*
	Rheumatism..................	*6*	+	*12*
	Scarlatina.....................	*4*	+	*16*
	Small-pox.....................	*0*	....	*0*
	Tonsilitis.....................	*11*	—	*4*
	Whooping-cough.............	*0*	....	*0*
	Mumps........................	*6*	+	*12*
	Dyspepsia....................	*11*	+	*4*
	....	....	....	......

a. Please mark the disease of which there is the greatest number of cases, 1; the disease having next greatest number of cases, 2; the next, 3; and so on for each disease, writing the same figures opposite diseases having the same number of cases. Write 0 opposite diseases not present. [For entire plan, see "Printed Letter Stating Plan," or pages 240-247, Fifth Annual Report of S. B. of H.] A blank indicates that the item has been overlooked.

b. The sign = indicates the usual severity; + indicates more, — indicates less than the usual severity. Please mail this, signed and dated, as soon as convenient after close of week specified.

...., *M. D.*

HOW THE REPORTS ARE USED.

DISEASES BY LOCALITIES.

First the reports from each locality are compiled by months, by finding for each locality the average of the numbers denoting order of prevalence of the several diseases for the month,—which average order is regarded as an indication of the actual order of prevalence of the diseases for that time. There is also found for each locality what per cent of the reports received state presence of each disease for the given month. This per cent of reports for a single locality indicates what part of the month the disease was present at that locality; it may also be called the per cent of weeks present. These first results of the compilation of reports by localities are given in Table 3, pages 326–75. Those not interested in the details for localities can easily omit this part of the compilation.

DISEASES IN THE STATE BY MONTHS AND YEAR.

A combination of the statements for localities is made by months showing for the State, so far as represented by the localities from which reports are received,—

(1.) What per cent of the observers reported each disease each month, from which may be obtained some idea of the territorial distribution of the several diseases during the month.

(2.) An average, for the localities at which a given disease was reported, of the per cent of weeks it was reported at those localities, indicating what part of the month, on an average, the disease was present at those localities.

(3.) What per cent of all the reports received for the month stated the presence of each disease. These statements afford an indication of the relative prevalence, as regards both area and time, of the several diseases during the month.

(4.) An average of the numbers denoting the order of prevalence of each disease at the localities at which it was reported present during the month. This average order of prevalence affords for some of the leading diseases an indication of their relative prevalence.

On pages 316–19, being a part of Table 2 for the State, are given by months the foregoing statements relative to each of the 26 diseases tabulated.

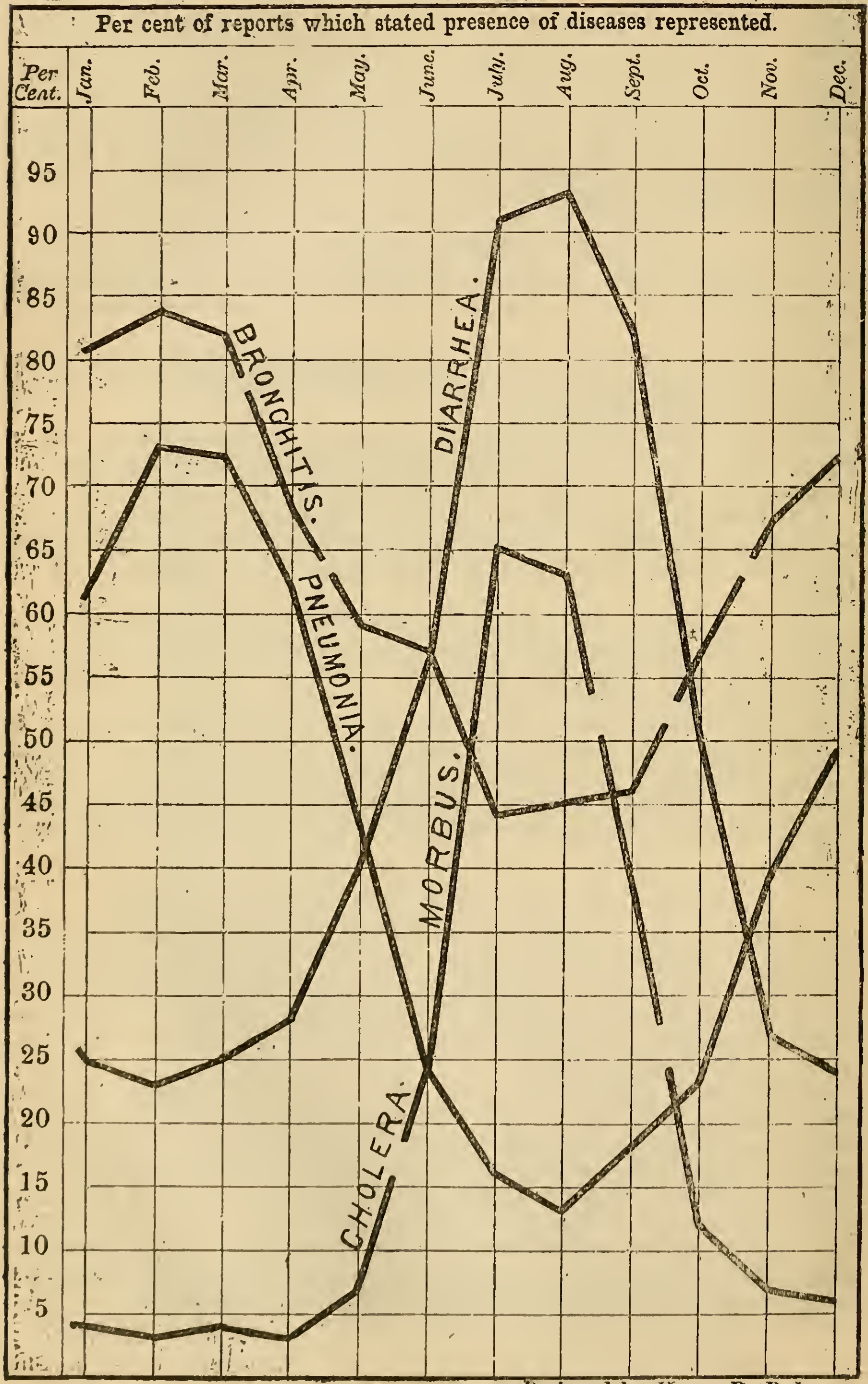
These statements by months are on pages 314–15 combined into a summary for the State for the year. With this is also given a summary for the year of statements received relative to the severity of each disease from week to week.

DISEASES BY DIVISIONS OF THE STATE, BY MONTHS AND YEAR.

In order to facilitate the study of the causes of sickness and deaths, the State has been divided into eleven divisions. From localities in ten of these divisions reports were received during the year 1880. For eight of these ten divisions a summary has been made by months showing what per cent of all the reports received from the division stated presence of each disease. This summary is printed on pages 320–3.

For the six of these divisions from which the greatest number of reports were received, which are also the most thickly-settled divisions, a summary has been made relative to the same facts summarized for the State, viz., the per cent of observers reporting each disease, the average time each disease was reported present at localities where reported present at any time during the year, the per cent of all reports received from the division on which each disease was reported present, and the average order of prevalence of the several diseases. This summary for the year is printed, as Table 4, on pages following. A list of the counties in each division is in Exhibit 1, page 257.

DIAGRAM 1.—WEEKLY REPORTS OF DISEASES IN MICHIGAN, IN 1880.



Designed by Henry B. Baker.

WHAT THE COMPILATION SHOWS.

MONTHS OF MOST SICKNESS FROM GIVEN DISEASES.

In the first place, so far as the localities from which reports are received represent the State, the compilation indicates in what months of the year each

EXHIBIT 7.—*Per Cent of Weekly Reports Stating Presence of each of Diseases Represented, for the Years 1877, 1878, 1879, and 1880, and for each Month of the Year 1880; also Average Per Cent for Diseases Reported Present.—Compiled from Weekly Reports by Health officers of Cities and Regular Correspondents of the State Board of Health.**

DISEASES.	YEAR.				MONTHS, 1880.											
	1877.	1878.	1879.	1880.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
AV. FOR TABULATED DISEASES REPORT'D PRES'T	28	30	33	32	32	32	32	31	30	31	34	36	34	32	30	31
Brain, Inflam'n of	-----	-----	-----	6	7	8	6	6	6	6	5	8	7	8	4	3
Bowels, Inflam'n of	-----	-----	-----	12	13	8	11	12	12	14	18	20	14	8	9	8
Bronchitis	55	64	64	64	81	84	82	68	59	57	44	45	46	57	67	72
Cerebro-spinal Men.	3	2	2	2	2	1	2	2	3	1	2	3	3	3	1	1
Cholera infantum	11	11	14	14	2	0.3	1	0.3	2	14	48	52	33	9	4	2
Cholera Morbus	15	14	19	20	4	3	4	3	7	24	65	63	39	12	7	6
Consumption, Pul.	52	71	70	68	65	69	70	72	70	69	66	62	66	66	68	70
Croup, Membranous	6	7	7	6	10	8	7	7	5	4	1	3	3	6	8	11
Diphtheria	19	23	29	27	27	30	29	30	23	18	21	18	27	35	36	36
Diarrhea	41	41	48	47	25	23	25	28	40	56	91	93	82	50	27	24
Dysentery	21	19	18	18	6	5	6	7	7	17	43	58	41	16	7	5
Erysipelas	20	21	25	25	25	23	30	33	34	25	22	20	17	22	23	28
Fever, Intermittent	75	83	82	82	68	69	71	79	90	91	92	91	93	90	79	71
Fever, Remittent	52	58	57	56	43	47	47	53	56	59	62	70	72	66	50	49
Fever, Typhoid	14	10	12	14	8	13	7	5	6	5	10	19	26	23	22	17
Fever, Typho-mal'r'l	26	24	22	24	23	18	12	7	6	12	21	35	51	52	30	22
Influenza	41	44	45	42	65	69	60	45	34	23	14	31	28	33	48	52
Measles	7	5	12	19	13	20	23	36	39	34	21	10	5	4	7	9
Neuralgia	-----	-----	59	61	70	70	75	69	63	61	53	53	50	64	65	69
Pneumonia	40	41	41	42	62	73	72	62	43	24	16	13	18	23	39	49
Puerperal Fever	4	3	3	3	4	2	3	3	4	5	3	3	3	4	3	1
Rheumatism	60	68	72	71	81	80	79	70	70	68	63	61	61	66	72	74
Scarlatina	21	25	23	15	22	21	17	21	18	14	8	7	9	12	17	18
Small-pox	4	0.2	0.4	0.4	0.3	0.3	1	1	1	0	0	0	0	0	1	0
Tonsilitis	-----	-----	45	49	64	65	61	48	44	39	28	30	36	44	59	63
Whooping-cough	21	21	23	32	29	33	35	35	36	41	37	35	33	23	23	19

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* For 1877, from 3,320 weekly reports by 115 observers; for 1878, from 3,221 weekly reports by 97 observers; for 1879, from 3,755 weekly reports by 110 observers; for 1880, from 3,991 weekly reports by 112 observers (health officers and correspondents).

[Graphic representations of statements in Exhibit 7 are given in Diagram 1, on the page opposite this, and in Diagrams 2, 3, 4, and 5, on pages following. These diagrams, representing the sickness from the several diseases, may be compared directly with diagrams in the following article, representing the meteorological conditions at the same time.]

disease was most prevalent. One of the best indications of this may be seen by noticing what per cent of all reports received for each month stated presence of the disease in question. In Exhibit 7, page 309, statements of the per cent of reports stating presence of each of the 26 diseases tabulated are, for convenience of comparison, brought together for all the months of the year. An average is also given for each month, which affords an indication of the relative amount of sickness in the different months of the year. In order to facilitate the study, diagrams have been prepared, graphically representing the course of the several diseases by months during the year. One of these diagrams (page 308) faces the exhibit relative to per cent of reports. Others follow the tables. Diagram 5 also contains an average line for 26 diseases, representing, by months, the average per cent of reports stating presence of the diseases tabulated.

In these diagrams the upward course of a line denotes increased prevalence of the disease for months named at the top; and its downward course denotes a decrease. The amount of increase or decrease, and the per cent of reports stating presence of the disease may be determined by following the horizontal lines to numbers stated in the left margin. This per cent may also be determined by reference to Exhibit 7, page 309.

An indication of the relative prevalence of a given disease in the several months of the year may also be found by a study of what per cent of the observers report the disease each month. Statements relative to this fact are grouped by months in Table 1, pages 312–13. In this the several diseases are arranged in order in each month, according to the number of observers reporting them in 1880, those reported by the most observers being placed first in the column. In this table is also stated by months the per cent of observers who reported each disease in 1877–8–9.

WHAT DISEASES CAUSE MOST SICKNESS.

Another thing to be learned from the compilation is what diseases cause most sickness in Michigan. This question is not the same as what diseases cause most deaths, and is not to be answered by a study of deaths alone; for there is much sickness, burdensome and expensive, which does not result in death. By a comparison of the per cent of reports stating presence of the several diseases for the year, with the average order of prevalence of those diseases for the same time, an attempt is made to answer this question for the year 1880. The result is stated in Exhibit 10, on a following page. In this exhibit is also stated for convenience of comparison, the per cent of reports, and the average order of prevalence, of the same diseases in 1879.

In Exhibit 11, on following pages, a statement is made of what diseases are believed to have caused most sickness in 1880 in each of the six most thickly-populated divisions of the State, being the divisions from which the most reports were received.

CLIMATE AND SICKNESS.

The great variation of diseases with changes of season indicates the importance of a careful study as to what climatic conditions associate themselves with and may be causative of particular diseases. An attempt at such a study relative to twelve leading diseases is made in certain exhibits wherein are correlated for comparison statements relative to the comparative prevalence of those diseases by months with statements of certain prominent meteorological conditions. The diseases thus treated are bronchitis, pneumonia, membranous croup, diphtheria, tonsilitis, influenza, rheumatism, neuralgia, pulmonary consumption, diarrhea, cholera infantum, and intermittent fever. The Exhibits, with comments, follow Table 4.

EXHIBIT 8.—*Giving, by Months of the Year 1880 (ending Saturday, January 1, 1881), for the State, and for each of the Ten Geographical Divisions of Michigan from which Weekly Reports of Diseases were received, the Number of Observers from whom the Reports were received; the Number of Reports received; the Day on which, for the purposes of this compilation, each month is made to end; and the Number of Weeks thus included in each Month.*

MONTHS, 1880.	MONTHS AND YEAR END SATURDAY,	Number of Weeks.	STATE.		DIVISIONS OF THE STATE.*																			
					1. UPPER-PENINSULAR.*		2. NORTH-WESTERN.*		4. NORTH-EASTERN.*		5. WESTERN.*		6. NORTH'N CENT'L.*		7. BAY AND EASTERN.*		8. CENTRAL.*		9. SOUTH-WESTERN.*		10. SOUTHERN CENTRAL.*		11. SOUTH-EASTERN.*	
			Observers.	Reports.†	Observers.	Reports.†	Observers.	Reports.†	Observers.	Reports.†	Observers.	Reports.†	Observers.	Reports.†	Observers.	Reports.†	Observers.	Reports.†	Observers.	Reports.†	Observers.	Reports.†	Observers.	Reports.†
YEAR 1880....‡	Jan. 1, 1881..	52	112	3,991	4	125	6	106	1	16	9	335	2	99	18	618	24	840	9	388	26	941	13	493
Av. per Month	....	4	79	333	3	10	2	9	§ 1	§ 4	7	28	2	8	13	54	17	70	8	32	19	78	10	41
January.......	Jan. 31, 1880.	4	83	327	3	12	3	12	1	4	6	24	1	4	14	53	19	74	9	36	18	72	9	36
February......	Feb. 28, 1880.	4	87	332	4	14	2	7	1	4	7	27	2	8	14	55	20	76	9	34	19	74	9	33
March.........	April 3, 1880.	5	85	417	3	15	2	10	1	5	7	33	2	10	14	69	19	94	9	43	19	94	9	41
April..........	May 1, 1880.	4	83	315	3	12	2	8	1	3	7	28	2	8	12	46	18	67	8	29	20	76	10	38
May...........	May 29, 1880.	4	81	314	3	11	2	8	0	0	8	30	2	8	11	43	19	73	8	31	18	71	10	39
June..........	July 3, 1880.	5	74	363	2	10	2	10	0	0	7	35	2	10	11	53	17	81	7	34	17	85	9	45
July...........	July 31, 1880.	4	80	317	2	8	2	8	0	0	7	27	2	8	13	52	18	70	7	28	19	76	10	40
August........	Aug. 28, 1880.	4	80	308	2	8	2	8	0	0	6	24	2	8	13	51	18	69	7	26	20	74	10	40
September....	Oct. 2, 1880.	5	77	373	2	9	2	10	0	0	6	30	2	10	13	64	15	72	7	34	20	94	10	50
October.......	Oct. 30, 1880.	4	76	291	2	8	2	8	0	0	7	26	2	8	13	52	14	55	8	30	18	67	10	40
November....	Nov. 27, 1880.	4	75	292	2	8	2	7	0	0	7	26	2	8	13	50	14	54	7	28	18	71	10	40
December.....	Jan. 1, 1881.	5	69	339	2	10	2	10	0	0	5	25	2	9	12	60	11	55	7	35	18	87	10	48

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* For counties in each division, see Exhibit 1, page 257.

† From some of the observers reports were not received for every week, so that the number of reports received does not equal the number of observers multiplied by the number of weeks in the given month or in the year.

‡ In some localities there were more observers than one. The whole number of localities from which reports were received was 82; the average number per month was 69. The number of cards received from each observer for each month and for the year is stated in Exhibit 9, pages 324-5.

Average for 4 months.

TABLE 1.—WEEKLY REPORTS OF DISEASES IN MICHIGAN IN 1880.—*Exhibiting by Months of the Three Years ending January 1, 1881, for each of 26 Diseases, the Per Cent of Observers in Michigan, in each Month, who reported the Presence of each Disease.—Compiled from Weekly Reports by Health Officers of Cities and Regular Correspondents of the State Board of Health*—for 1880, from 3,991 Reports by 112 Observers; for 1879, from 3,755 Reports by 110 Observers; for 1878, from 3,221 Reports by 97 Observers; and for 1877, from 3,320 Reports by 115 Observers.—Diseases arranged by Months in order of Greatest Number of Observers reporting them present in 1880.*

PER CENT OF OBSERVERS BY WHOM EACH DISEASE WAS REPORTED PRESENT IN—

LINE NUMBER.	JANUARY.*					FEBRUARY.*					MARCH.*				
	DISEASES.	1880.	1879.	1878.	1877.	DISEASES.	1880.	7879.	1878.	1877.	DISEASES.	1880.	1879.	1878.	1877.
	Average	42	47	41	40	Average	42	44	40	38	Average	44	46	39	36
1	Rheumatism	95	94	88	82	Bronchitis	94	92	82	89	Bronchitis	92	87	84	90
2	Bronchitis	88	94	84	85	Rheumatism	92	89	82	86	Neuralgia	91	81		
3	Neuralgia	84	67			Pneumonia	86	89	75	86	Pneumonia	91	90	73	81
4	Pneumonia	82	91	71	88	Neuralgia	82	75			Rheumatism	88	87	88	79
5	Intermittent Fever	81	80	86	69	Intermittent Fever	80	78	83	69	Intermittent Fever	84	83	85	71
6	Tonsilitis	78	77			Influenza	78	88	62	76	Consumption, Pulm.	81	75	81	59
7	Influenza	75	86	66	73	Tonsilitis	78	80			Tonsilitis	79	81		
8	Consumption, Pulm.	73	80	77	66	Consumption, Pulm.	77	78	79	52	Influenza	75	83	62	72
9	Remittent Fever	53	53	73	52	Remittent Fever	54	47	65	51	Remittent fever	60	52	67	59
10	Erysipelas	46	45	47	49	Diphtheria	45	52	39	38	Erysipelas	53	51	32	40
11	Diarrhea	45	36	40	43	Erysipelas	43	47	39	41	Diphtheria	49	43	38	35
12	Diphtheria	41	55	51	51	Whooping-cough	40	33	18	32	Diarrhea	46	35	49	37
13	Typho-mal. Fever	39	22	34	24	Diarrhea	39	34	45	38	Whooping-cough	45	30	15	29
14	Whooping-cough	39	39	19	34	Scarlatina	31	44	51	38	Measles	41	14	5	16
15	Scarlatina	34	61	34	43	Measles	30	11	7	10	Scarlatina	34	52	52	34
16	Inflam. of Bowels	29				Typho-mal. Fever	29	20	24	18	Inflam. of Bowels	29			
17	Measles	24	14	5	12	Typhoid Fever (Ent.)	22	6	15	15	Typho mal. Fever	26	19	26	21
18	Membran. Croup	20	38	22	33	Inflam. of Brain	17				Typhoid Fever (Ent.)	15	11	11	9
19	Typhoid Fever (Ent.)	18	9	19	21	Membranous Croup.	17	23	14	21	Cholera Morbus	14	10	14	6
20	Dysentery	16	11	16	12	Inflam. of Bowels	16				Membranous Croup.	14	22	14	22
21	Inflam. of Brain	13				Dysentery	14	9	10	13	Inflam. of Brain	13			
22	Cholera Morbus	10	5	7	10	Cholera Morbus	7	9	18	3	Dysentery	13	14	21	12
23	Puerperal Fever	8	13	12	16	Puerperal Fever	6	8	8	7	Puerperal Fever	8	13	8	19
24	Cholera Infantum	5	5	5	3	Cerebro-s. Meningitis	2	5	7	8	Cerebro-s. Meningitis	7	8	5	6
25	Cerebro-s. Meningitis	2	5	7	3	Cholera Infantum	1	5	6	0	Cholera Infantum	4	8	8	1
26	Small-pox	1	0	0	10	Small-pox	1	0	0	6	Small-pox	1	0	0	4

LINE NUMBER.	APRIL.*					MAY.*					JUNE.*				
	DISEASES.	1880.	1879.	1878.	1877.	DISEASES.	1880.	1879.	1878.	1877.	DISEASES.	1880.	1879.	1878.	1877.
	Average	41	46	38	36	Average	40	41	39	38	Average	46	41	35	34
1	Intermittent Fever	90	92	92	81	Intermittent Fever	93	96	97	93	Intermittent Fever	96	96	93	96
2	Pneumonia	86	82	73	72	Rheumatism	83	90	80	83	Rheumatism	89	86	82	70
3	Rheumatism	84	95	87	75	Consumption, Pulm.	79	88	80	63	Neuralgia	81	77		
4	Neuralgia	82	78			Neuralgia	75	69			Diarrhea	78	63	48	56
5	Bronchitis	80	88	79	80	Bronchitis	74	78	78	70	Bronchitis	77	68	66	46
6	Consumption, Pulm.	78	82	79	63	Remittent Fever	69	68	65	72	Remittent Fever	77	74	70	67
7	Tonsilitis	70	78			Pneumonia	65	67	68	57	Consumption, Pulm.	73	78	70	61
8	Remittent Fever	61	62	62	58	Tonsilitis	65	71			Tonsilitis	64	64		
9	Influenza	57	78	63	59	Erysipelas	58	51	37	50	Cholera Morbus	57	33	30	32
10	Measles	54	23	5	22	Diarrhea	57	49	45	53	Measles	51	32	7	19
11	Erysipelas	52	50	30	50	Whooping-cough	51	24	27	33	Whooping-cough	51	25	25	32
12	Whooping-cough	45	27	17	23	Measles	49	29	8	27	Erysipelas	49	49	26	33
13	Diphtheria	43	42	38	31	Influenza	46	53	62	57	Pneumonia	47	47	56	32
14	Diarrhea	41	48	40	33	Diphtheria	38	36	27	15	Cholera Infantum	35	12	18	26
15	Scarlatina	31	47	32	38	Inflam. of Bowels	28				Dysentery	35	16	26	28
16	Inflam. of Bowels	20				Scarlatina	23	33	33	33	Influenza	34	43	48	33
17	Typho-mal. Fever	14	17	29	19	Cholera Morbus	16	18	13	23	Diphtheria	32	35	23	18
18	Membranous Croup.	13	22	16	13	Inflam. of Brain	15				Typho mal. Fever	30	21	25	21
19	Inflam. of Brain	12				Typho-mal. Fever	14	15	23	20	Scarlatina	30	28	28	37
20	Dysentery	11	10	14	16	Dysentery	12	11	23	23	Inflam. of Bowels	28			
21	Cholera Morbus	8	12	13	9	Cerebro-s. Meningitis	7	1	10	7	Puerperal fever	14	6	5	9
22	Typhoid Fever (Ent.)	8	12	10	16	Membranous Croup.	7	11	10	8	Inflam. of Brain	12			
23	Puerperal Fever	7	7	12	11	Typhoid Fever (Ent.)	7	7	10	13	Membranous Croup.	8	6	10	5
24	Cerebro-s. Meningitis	5	10	3	6	Puerperal Fever	6	7	8	10	Typhoid Fever (Ent.)	8	6	11	11
25	Cholera Infantum	1	5	5	3	Cholera Infantum	5	1	7	7	Cerebro-s. Meningitis.	4	4	5	11
26	Small-pox	1	0	0	8	Small-pox	1	1	0	10	Small-pox	0	4	2	5

* For 1880 the number of observers, reports, weeks in each month, etc., are stated in the first five columns of Exhibit 8, page 311; the names of the observers and the number of reports received from each are stated in Exhibit 9, pages 324-5.

TABLE 1.—CONTINUED.

PER CENT OF OBSERVERS BY WHOM EACH DISEASE WAS REPORTED PRESENT IN—

Line Number.	JULY.*					AUGUST.*					SEPTEMBER.*				
	DISEASES.	1880.	1879.	1878.	1877.	DISEASES.	1880.	1879.	1878.	1877.	DISEASES.	1880.	1879.	1878.	1877.
	Average	47	46	40	36	Average	48	48	41	40	Average	49	49	45	40
1	Diarrhea	99	96	86	89	Diarrhea	99	99	94	96	Diarrhea	99	96	98	97
2	Intermittent Fever	98	96	93	93	Intermittent Fever	96	95	94	95	Intermittent Fever	97	96	94	93
3	Cholera Morbus	88	82	63	67	Cholera Morbus	85	87	59	77	Remittent Fever	79	79	84	80
4	Rheumatism	83	80	73	58	Remittent Fever	80	90	80	82	Rheumatism	78	78	73	67
5	Consumption, Pulm.	74	77	71	53	Dysentery	78	78	71	91	Consumption, Pulm.	75	73	76	42
6	Remittent Fever	74	80	80	69	Rheumatism	75	69	65	57	Cholera Morbus	74	64	56	58
7	Neuralgia	70	76			Consumption, Pulm.	73	75	71	41	Typho-mal. Fever	71	57	60	63
8	Cholera Infantum	66	56	46	38	Cholera Infantum	70	71	62	63	Neuralgia	69	68		
9	Bronchitis	65	55	63	37	Neuralgia	70	67			Dysentery	66	62	73	82
10	Dysentery	64	56	51	55	Bronchitis	56	53	56	34	Bronchitis	64	63	65	48
11	Whooping-cough	48	33	27	35	Typho-mal. Fever	54	42	39	43	Cholera Infantum	58	57	60	45
12	Tonsilitis	45	48			Tonsilitis	50	49			Tonsilitis	58	53		
13	Erysipelas	40	54	27	25	Whooping-cough	50	27	30	34	Whooping-cough	48	32	32	23
14	Typho-mal. Fever	39	28	31	31	Influenza	41	33	38	27	Diphtheria	45	36	27	22
15	Inflam. of Bowels	36				Erysipelas	35	34	33	23	Influenza	42	48	51	35
16	Diphtheria	36	38	22	18	Diphtheria	31	41	23	14	Pneumonia	38	42	25	25
17	Pneumonia	34	39	39	24	Inflam. of Bowels	30				Typhoid Fever (Ent.)	36	31	22	38
18	Measles	33	26	10	16	Pneumonia	29	23	26	23	Inflam. of Bowels	32			
19	Influenza	26	35	42	35	Typhoid Fever (Ent.)	28	23	18	25	Erysipelas	32	32	29	18
20	Typhoid Fever (Ent.)	18	12	10	7	Inflam. of Brain	16				Scarlatina	20	25	35	22
21	Scarlatina	16	29	25	29	Measles	16	8	8	11	Inflam. of Brain	16			
22	Inflam. of Brain	10				Scarlatina	13	23	27	23	Measles	13	14	3	5
23	Puerperal Fever	10	9	3	2	Cerebro-s. Meningitis	10	7	3	5	Cerebro-s. Meningitis	8	2	6	7
24	Cerebro-s. Meningitis	5	5	3	2	Puerperal Fever	8	2	6	7	Membranous Croup	8	9	5	10
25	Membranous Croup	3	1	2	2	Membranous Croup	6	5	2	5	Puerperal Fever	8	9	5	7
26	Small-pox	0	2	5	7	Small-pox	0	0	2	5	Small-pox	0	0	2	5

Line Number.	OCTOBER.*					NOVEMBER.*					DECEMBER.*				
	DISEASES.	1880.	1879.	1878.	1877.	DISEASES.	1880.	1879.	1878.	1877.	DISEASES.	1880.	1879.	1878.	1877.
	Average	44	49	47	44	Average	40	44	39	40	Average	43	46	41	39
1	Intermittent Fever	96	91	97	93	Intermittent Fever	89	86	92	88	Rheumatism	88	82	87	86
2	Rheumatism	82	89	82	84	Rheumatism	84	84	80	89	Neuralgia	84	80		
3	Neuralgia	80	82			Bronchitis	80	75	79	87	Tonsilitis	84	80		
4	Bronchitis	75	75	79	70	Neuralgia	77	78			Intermittent Fever	83	81	80	82
5	Consumption, Pulm.	74	78	79	71	Consumption, Pulm.	75	74	75	75	Bronchitis	81	92	85	91
6	Remittent Fever	74	80	84	85	Tonsilitis	73	70			Consumption, Pulm.	77	76	77	73
7	Diarrhea	72	86	66	82	Influenza	65	49	62	55	Pneumonia	77	75	77	71
8	Typho-mal. Fever	67	57	70	72	Pneumonia	64	62	59	57	Remittent Fever	64	67	54	72
9	Tonsilitis	64	72			Remittent Fever	61	64	74	75	Influenza	59	68	67	59
10	Diphtheria	51	57	46	44	Diphtheria	53	55	49	46	Diphtheria	57	60	54	41
11	Influenza	47	42	59	55	Diarrhea	48	59	43	58	Erysipelas	52	39	34	27
12	Erysipelas	41	30	43	32	Erysipelas	44	36	38	26	Diarrhea	42	49	36	33
13	Pneumonia	41	37	49	43	Typho-mal. Fever	39	42	39	55	Scarlatina	38	37	51	26
14	Typhoid Fever (Ent.)	33	35	31	35	Typhoid Fever (Ent.)	31	30	15	38	Typho-mal. Fever	32	35	28	44
15	Whooping-cough	32	32	44	26	Whooping-cough	29	34	43	22	Whooping-cough	28	39	41	21
16	Dysentery	30	41	43	56	Scarlatina	28	32	39	37	Membranous Croup	26	32	25	19
17	Cholera Morbus	25	38	18	30	Inflam. of Bowels	17				Typhoid Fever (Ent.)	25	31	16	28
18	Scarlatina	29	35	44	34	Membranous Croup	17	19	28	16	Measles	19	20	10	5
19	Inflam. of Bowels	17				Dysentery	15	23	13	22	Cholera Morbus	17	11	8	9
20	Inflam. of Brain	16				Cholera Morbus	13	8	7	16	Inflam of Bowels	16			
21	Cholera Infantum	16	19	26	23	Measles	13	12	8	4	Dysentery	10	23	11	15
22	Membranous Croup	14	11	16	12	Inflam. of Brain	9				Inflam. of Brain	7			
23	Measles	11	10	3	1	Cholera Infantum	8	10	3	8	Cholera Infantum	6	5	2	4
24	Cerebro s. Meningitis	9	6	8	10	Puerperal Fever	8	8	8	11	Cerebro-s. Meningitis	4	5	5	8
25	Puerperal Fever	9	11	5	10	Cerebro-s. Meningitis	4	0	5	3	Puerperal Fever	4	7	3	5
26	Small-pox	0	0	0	4	Small-pox	1	1	2	1	Small-pox	0	3	0	0

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* For 1880 the number of observers, reports, weeks in each month, etc., are stated in the first five columns of Exhibit 8, page 311; the names of the observers and the number of the reports received from each are stated in Exhibit 9, pages 324-5.

Table 1, stating by months what per cent of the observers reported the several diseases present, may be compared with Exhibit 4, pages 262–3, which states by months how many observers reported many of the same diseases, in reply to circulars issued at the close of each of the same years represented in Table 1. The most complete summary for the year 1880 is comprised in Table 2, on the two pages immediately following this.

TABLE 2.—WEEKLY REPORTS OF DISEASES IN MICHIGAN IN 1880.—*Exhibiting for the Year, and for each Month of the Year, 1880 (ending Saturday, January 1, 1881), a Summary relative to Diseases in the State of Michigan; also for each Month a Summary relative to Diseases in each of 10 Geographical Divisions* of the State,—Indicating (for the State) the Prevalence as regards both Time and Area, and also the Comparative Severity of the Diseases.—Compiled from 3,991 Weekly Reports by 112 Health Officers of Cities and Regular Correspondents of the State Board of Health.*

NUMBER OF OBSERVERS, REPORTS, ETC.	DISEASE.	Per Cent of Observers Reporting Presence of.[b]	Av. Per Ct. of Weeks Reported Present Where Present.[c]	Per Cent of Reports Stating Presence of.[d]	Av. Order of Prevalence Where Present.[e]	Times Reported More than Usually Severe.	Times Reported Usually Severe.	Times Reported Less than Usually Severe.	Difference between "Times Reported More" and "Times Reported Less" than Usually Severe.[f]	Av. Times per Month Reported More than Usually Severe.	Av. Times per Month Reported Usually Severe.	Av. Times per Month Reported Less than Usually Severe.	Av. Difference between "Times More" and "Times Less" Severe.[f]
FOR THE YEAR 1880 (ENDING JANUARY 1, 1881.)†	Average for Tabulated Diseases Reported Present	43	73	32	4.7	105.3	697.0	258.7	-153.4	8.8	58.1	21.6	-12.8
Whole No. of Localities represented, 82.[g]	Brain, Inflammation of	13	49	6	8.1	26	100	95	-69	2.2	8.3	7.9	-5.8
	Bowels, Inflammation of	25	49	12	7.0	58	234	143	-85	4.8	19.5	11.9	-7.1
	Bronchitis	77	83	64	3.7	182	1455	508	-326	15.2	121.3	42.3	-27.2
Av. No. of Localities represented per month, 69.[g]	Cerebro-spinal Meningitis	6	34	2	7.1	11	33	16	-5	.9	2.8	1.3	-.4
	Cholera Infantum	23	60	14	5.2	45	305	112	-67	3.8	25.4	9.3	-5.6
	Cholera Morbus	34	57	20	5.3	59	453	124	-65	4.9	37.8	10.3	-5.4
	Consumption, Pulmonary	76	89	68	5.7	175	1958	170	+5	14.6	163.2	14.2	+.4
Whole No. of Observers during the year, 112.	Croup, Membranous	13	47	6	7.4	39	94	68	-29	3.3	7.8	5.7	-2.4
	Diphtheria	43	63	27	5.7	168	439	347	-179	14.0	36.6	28.9	-14.9
	Diarrhea	63	73	47	4.2	152	979	422	-270	12.7	81.6	35.2	-22.5
	Dysentery	30	59	18	5.8	46	354	212	-166	3.8	29.5	17.7	-13.8
Av. No. of Observers per month, 79.	Erysipelas	45	56	25	6.3	81	492	262	-181	6.8	41.0	21.8	-15.1
	Fever, intermittent	90	91	82	2.3	173	1959	649	-476	14.4	163.3	54.1	-39.7
Total No. of Reports Compiled, 3,991.[a]	Fever, Remittent	67	83	56	3.3	149	1196	500	-351	12.4	99.7	41.7	-29.3
	Fever, Typhoid (Enteric)	21	66	14	6.5	72	264	128	-56	6.0	22.0	10.7	-4.7
	Fever, Typho-malarial	37	64	24	5.5	105	538	183	-78	8.8	44.8	15.3	-6.5
	Influenza	54	78	42	3.0	188	943	302	-114	15.7	78.6	25.2	-9.5

Av. No. of Reports per month, 333.	Measles	30	62	19	4.8	75	386	159	-84	6.3	32.2	13.3	-7.0
	Neuralgia	79	80	64	4.5	200	1493	415	-215	16.7	124.4	34.6	-17.9
	Pneumonia	62	68	42	5.1	180	958	328	-148	15.0	79.8	27.3	-12.3
	Puerperal Fever	8	40	3	7.8	16	71	25	-9	1.3	5.9	2.1	-.8
	Rheumatism	85	83	71	4.6	229	1494	592	-363	19.1	124.5	49.3	-30.3
	Scarlatina	26	57	15	6.5	63	203	232	-169	5.3	16.9	19.3	-14.1
	Small-pox	1	64	0.4	6.3	13	0	1	+12	2.2	0	.1	+1.0
	Tonsilitis	67	72	49	4.4	173	1114	390	-217	14.4	92.8	32.5	-18.1
	Whooping-cough	42	76	32	4.8	60	607	343	-283	5.0	50.6	28.6	-23.6

* For Counties in each Division, see Exhibit 1, page 257. † For Number of Observers, Reports, Weeks in each Month, etc., see Exhibit 8, page 311; for Names of observers and number of reports received from each, see Exhibit 9, pages 324-5.

[a] Not every one of the observers sent in a report for every week, so that the number of reports received does not equal the number of observers multiplied by the number of weeks.

[b] Indicates the Area of Prevalence, except that in a few instances there were two or more observers in one city or village.

[c] This column gives the per cent which the number of reports stating presence of a disease is of the number of card-reports *received* from such of the observers as reported the disease present. It is, therefore, an average not for all localities represented, but only for those at which the given disease was reported present. In the line "Average for Tabulated Diseases," it gives the per cent which the number of times *all* diseases are reported present is of the number of times they *might have been* so reported on the cards received, for the time specified, from the observers who reported the diseases present at all. It will be seen that this is a more accurate average than would be obtained by dividing the sum of the column by the number of diseases reported present.

[d] This column gives the per cent which the number of reports stating presence of a disease is of the whole number of reports received for the time specified, from *all observers* in the State or division, as the case may be. It combines and states in a general way, an idea of the *time* a disease was prevalent, with an idea of the area of its prevalence. Had every observer sent a report every week of the month or year, the numbers in this column would be (for the State) the product of the numbers in the same line in the two preceding columns.

[e] The disease having the greatest number of cases was to be marked 1 in the order; the disease having the next greatest number of cases, 2; and so on. Diseases not present were to be marked 0. The numbers in this column are found by dividing the totals (for the State) of the Order of Prevalence columns, in Table 3, (pages 326-75) by the number of men who reported the disease present. The column is, therefore, an average not for all the localities represented, but only for those at which the given disease was reported present. The "Average for Tabulated Diseases" is found by dividing the sum of the totals in the Order of Prevalence columns, in Table 3, for all diseases reported present, by the sum of the numbers of men who reported the different diseases present, thus counting each man once for every disease he reported present. As a rule, small numbers in this column indicate a large prevalence of the disease, and *vice versa*.

[f] The + sign indicates that the times reported "more" exceed those reported "less" than usually severe; the - sign, that the times reported "less" exceed those reported "more" than usually severe, the number of times by which either exceeds the other being indicated by the numbers stated.

[g] In this statement Ionia and the State House of Correction at Ionia, and Jackson and the State Prison at Jackson are counted as separate localities.

For 1880 statements concerning the severity of diseases reported were made for only about 84 per cent of the diseases reported present. When all the observers can take the trouble to fill out the blanks for statements concerning the severity of the diseases they report, a more valuable summary can be deduced from these statements.

TABLE 2.—CONTINUED.—*Diseases in the State,—January to June, 1880.* (*For foot-notes and full tabular heads, see pages 314–15.*)

MONTHS.†	DISEASES.	Per ct. of Observers Reporting Pres. of.b	Av. per ct. of Weeks Reported Present where Present.a,c	Per cent of Reports Stating Pres'nce of.d	Av. Order of Prevalence where Pres.e	Times Rep'ted More than usually Severe.	Times Rep'ted Usually Severe.	Times Rep'ted Less than usually Severe.	Difference between Times "More" and "Less" Severe.f	MONTHS.†	Per ct. of Observers Reporting Pres. of.b	Av. per ct. of Weeks Reported Present where Present.a,c	Per cent of Reports Stating Pres'nce of.d	Av. Order of Prevalence where Pres.e	Times Rep'ted More than usually Severe.	Times Rep'ted Usually Severe.	Times Rep'ted Less than usually Severe.	Difference between Times "More" and "Less" Severe.f	MONTHS.†	Per ct. of Observers Reporting Pres. of.b	Av. per ct. of Weeks Reported Present where Present.a,c	Per cent of Reports Stating Pres'nce of.d	Av. Order of Prevalence where Pres.e	Times Rep'ted More than usually Severe.	Times Rep'ted Usually Severe.	Times Rep'ted Less than usually Severe.	Difference between Times "More" and "Less" Severe.f
JANUARY.†	Av. for Tab. Dis. Repid. Pres.	42	75	32	4.8	11.2	54.0	23.7	-12.5	FEBRUARY.†	42	78	32	4.7	10.2	59.7	22.1	-11.9	MARCH.†	44	73	32	4.7	12.8	71.2	28.9	-16.1
	Brain, Inflammation of	13	57	7	9.7	5	9	12	-7		17	47	8	8.6	5	12	10	-5		13	47	6	7.9	2	12	10	-8
	Bowels, inflammation of	29	47	13	8.2	10	18	11	-1		16	49	8	8.4	3	9	11	-8		29	38	11	7.4	11	20	13	-2
	Bronchitis	88	92	81	3.1	34	150	52	-18		94	89	84	3.1	23	177	40	-17		92	90	82	3.2	29	193	66	-37
	Cerebro-spinal Meningitis	2	63	2	4.5	1	2	0	+1		2	38	1	4.5	0	4	1	-1		7	28	2	10.0	3	0	3	0
	Cholera Infantum	5	31	2	4.3	0	8	1	-1		1	25	0.3	4.0	1	2	0	+1		4	20	1	6.0	1	0	2	-1
	Cholera Morbus	10	45	4	6.5	0	10	3	-3		7	46	3	6.8	1	6	3	-2		14	30	4	5.4	1	13	2	-1
	Consumption, Pulmonary	73	88	65	5.6	14	162	15	-1		77	91	69	5.9	11	171	11	0		81	86	70	5.6	12	211	21	-9
	Croup, Membranous	20	49	10	6.3	7	13	8	-1		17	47	8	7.1	1	13	5	-4		14	51	7	7.6	2	14	8	-6
	Diphtheria	41	66	27	5.0	15	30	30	-15		45	67	30	5.6	14	34	34	-20		49	60	29	5.8	12	57	35	-23
	Diarrhea	45	58	25	5.9	6	34	27	-21		39	57	23	6.4	9	27	26	-17		46	55	25	5.9	12	44	27	-15
	Dysentery	16	37	6	7.2	3	8	5	-2		14	37	5	6.9	2	6	7	-5		13	44	6	6.6	4	11	7	-3
	Erysipelas	46	56	25	6.3	3	41	29	-26		43	56	23	6.3	5	36	25	-20		53	56	30	6.3	10	62	32	-22
	Fever, Intermittent	81	84	68	3.4	13	112	68	-55		80	85	69	3.6	10	119	71	-61		84	85	71	3.1	8	173	72	-64
	Fever, Remittent	53	81	43	4.3	5	66	41	-36		54	86	47	3.9	8	79	50	-42		60	78	47	4.0	14	90	56	-42
	Fever, Typhoid (Enteric)	18	58	8	6.2	3	8	12	-9		22	62	13	6.3	3	25	12	-9		15	48	7	6.4	0	18	5	-5
	Fever, Typho-malarial	39	60	23	6.7	6	46	24	-18		29	65	18	5.8	4	32	14	-10		26	46	12	5.7	8	22	13	-5
	Influenza	75	88	65	2.5	29	121	31	-2		78	88	69	2.3	42	123	29	+13		75	80	60	2.3	36	136	43	-7
	Measles	24	55	18	5.4	11	25	13	-2		30	67	20	4.8	7	35	15	-8		41	57	23	5.2	16	47	24	-8
	Neuralgia	84	84	70	4.3	31	115	39	-8		82	85	70	4.5	22	138	38	-16		91	83	75	4.2	25	178	57	-32
	Pneumonia	82	76	62	4.4	15	118	44	-29		86	86	73	4.1	39	136	33	+6		91	79	72	4.0	43	158	51	-8
	Puerperal Fever	8	46	4	6.6	1	13	0	+1		6	35	2	9.4	1	3	0	+1		8	37	3	6.6	1	8	1	0
	Rheumatism	95	85	81	4.6	32	125	63	-31		92	88	80	4.7	22	153	51	-29		88	89	79	4.3	31	171	04	-33
	Scarlatina	34	65	22	6.3	11	13	29	-18		31	65	21	6.9	8	20	30	-22		34	50	17	6.8	10	24	28	-18

	Small-pox	1	25	0.3	8.0	0	0	0	0		1	25	0.3	7.0	1	0	0	+1		1	100	1	5.0	4	0	0	+4
	Tonsilitis	78	82	64	3.8	30	110	41	-11		78	83	65	3.8	19	138	29	-10		79	78	61	4.1	28	125	66	-38
	Whooping-cough	89	77	29	4.9	6	52	19	-13		40	84	33	4.4	4	54	29	-25		45	78	35	4.5	0	64	45	-36
APRIL.†	Av. for Tab. Dis. Reptd. Pres.	41	76	31	4.7	7.7	51.1	22.1	-14.3	MAY.†	40	74	30	4.5	6.8	50.8	18.2	-11.3	JUNE.†	46	67	31	4.8	7.9	62.2	23.1	-15.2
	Brain, Inflammation of	12	51	6	7.9	0	9	6	-6		15	48	6	6.2	3	9	7	-4		12	51	6	7.7	0	7	9	-9
	Bowels, Inflammation of	20	58	12	6.5	1	24	8	-7		28	43	12	6.1	5	11	15	-10		28	51	14	6.8	1	30	14	-13
	Bronchitis	80	85	68	3.6	12	115	49	-37		74	80	59	3.5	9	98	43	-34		77	74	57	4.1	11	105	51	-40
	Cerebro-spinal Meningitis	5	38	2	7.8	2	2	1	+1		7	36	3	7.5	1	2	3	-2		4	27	1	5.3	0	4	0	0
	Cholera Infantum	1	50	0.3	7.0	0	1	0	0		5	38	2	6.3	0	4	2	-2		35	40	14	6.2	8	26	8	0
	Cholera Morbus	8	42	3	6.7	0	6	4	-4		16	42	7	6.5	1	15	2	-1		57	42	24	5.5	9	44	21	-12
	Consumption, Pulmonary	78	93	72	5.6	23	152	16	+7		79	87	70	5.4	18	145	13	+5		73	95	69	5.5	18	163	22	-4
	Croup, Membranous	13	55	7	8.4	2	6	8	-6		7	65	5	6.8	5	7	0	+5		8	47	4	7.2	3	8	2	+1
	Diphtheria	43	69	30	6.5	6	36	44	-38		38	60	23	5.9	8	35	27	-19		32	56	18	7.0	12	29	19	-7
	Diarrhea	41	67	28	5.7	12	32	25	-13		57	71	40	4.9	6	60	26	-20		78	71	56	4.0	17	107	46	-29
	Dysentery	11	61	7	10.3	1	8	9	-8		12	55	7	8.2	1	11	6	-5		35	47	17	6.2	4	34	14	-10
	Erysipelas	52	65	33	6.1	9	63	19	-10		58	58	34	5.5	11	55	18	-7		49	51	25	6.4	9	45	18	-9
	Fever, Intermittent	90	87	79	2.4	11	141	55	-44		93	97	90	1.8	14	169	51	-37		96	95	91	1.5	17	205	49	-32
	Fever, Remittent	61	85	53	3.4	14	77	47	-33		69	80	56	3.2	6	87	48	-42		77	77	59	3.2	9	112	46	-37
	Fever, Typhoid (Enteric)	8	61	5	10.0	4	6	4	0		7	83	6	9.0	2	10	4	-2		8	60	5	6.8	3	7	8	-5
	Fever, Typho-malarial	14	51	7	6.0	7	19	3	+4		14	48	6	7.3	3	13	2	+1		30	42	12	5.7	4	31	7	-3
	Influenza	57	81	45	2.8	7	77	38	-31		46	74	34	3.6	5	60	26	-21		34	68	23	3.9	2	46	29	-27
	Measles	54	65	36	4.2	9	55	27	-18		49	79	39	3.8	11	61	17	-6		51	67	34	4.6	10	68	18	-8
	Neuralgia	82	84	69	4.4	14	118	42	-28		75	82	63	4.0	17	112	22	-5		81	75	61	4.2	14	127	35	-21
	Pneumonia	86	73	62	4.5	27	98	40	-13		65	65	43	5.3	10	83	19	-9		47	51	24	5.8	5	54	17	-12
	Puerperal Fever	7	41	3	8.2	0	7	0	0		6	78	4	9.8	0	8	4	-4		14	35	5	9.4	3	6	6	-3
	Rheumatism	81	83	70	4.2	17	126	45	-28		83	84	70	3.9	17	121	37	-20		89	76	68	4.4	13	130	55	-42
	Scarlatina	31	66	21	6.7	4	25	25	-21		23	79	18	4.9	3	27	17	-14		30	49	14	5.8	6	24	11	-5
	Small pox	1	75	1	4.0	3	0	0	+3		1	100	1	4.0	4	0	0	+4		0	0	0	0	0	0	0	0
	Tonsilitis	70	69	48	4.3	11	84	31	-20		65	68	44	4.5	11	76	31	-23		64	61	39	4.8	11	77	32	-21
	Whooping-cough	45	76	35	4.5	5	51	28	-23		51	72	36	4.7	6	42	29	-23		51	80	41	4.6	9	67	40	-31

TABLE 2.—CONTINUED.—*Diseases in the State,—July to December, 1880. (For foot-notes and full tabular heads, see pages 314-15.)*

MONTHS.†	DISEASES.	Per Ct. of Observers Reporting Pres. of.b	Av. per Ct. of Weeks Reported Present where Present. a, c	Per Cent of Reports Stating Presence of.d	Av. Order of Prevalence where Pres.e	Times Reported More than usually Severe.	Times Reported Usually Severe.	Times Reported Less than usually Severe.	Difference between Times "More" and "Less" Severe.f	MONTHS.†	Per Ct. of Observers Reporting Pres. of.b	Av. Per Ct. of Weeks Reported Present where Present. a, c	Per Cent of Reports Stating Presence of.d	Av. Order of Prevalence where Pres.e	Times Reported More than usually Severe.	Times Reported Usually Severe.	Times Reported Less than usually Severe.	Difference between Times "More" and "Less" Severe.f	MONTHS.†	Per Ct. of Observers Reporting Pres. of.b	Av. Per Ct. of Weeks Reported Present where Present. a, c	Per Cent of Reports Stating Presence of.d	Av. Order of Prevalence where Pres.e	Times Reported More than usually Severe.	Times Reported Usually Severe.	Times Reported Less than usually Severe.	Difference between Times "More" and "Less" Severe.f
JULY.†	Av. for Tab. Dis. Reptd. Pres.	47	73	34	4.9	7.4	60.2	22.6	-15.2	AUGUST.†	48	76	36	5.0	8.1	60.0	22.7	-14.6	SEPTEMBER.†	49	70	35	4.9	10.9	73.2	25.4	-14.4
	Brain, Inflammation of	10	52	5	10.6	2	4	7	-5		16	51	8	8.3	2	10	9	-7		16	46	7	8.1	2	13	6	-4
	Bowels, Inflammation of	36	50	18	6.5	3	36	14	-11		30	68	20	6.3	10	23	20	-10		32	45	14	7.1	6	26	15	-9
	Bronchitis	65	67	44	5.2	6	78	39	-33		56	81	45	5.2	4	71	32	-28		64	76	46	4.8	5	89	41	-36
	Cerebro-spinal Meningitis	5	44	2	8.8	1	4	1	0		10	31	3	6.4	0	3	2	-2		8	38	3	7.1	1	8	0	+1
	Cholera Infantum	66	73	48	4.6	16	79	31	-15		70	75	52	4.5	12	90	37	-25		58	57	33	5.7	6	74	25	-19
	Cholera Morbus	88	74	65	4.3	16	126	23	-7		85	75	63	4.8	13	112	26	-13		74	53	39	5.4	13	80	28	-15
	Consumption, Pulmonary	74	90	66	6.0	10	143	14	-4		73	87	62	6.5	11	135	14	-3		75	86	66	6.0	16	183	15	+1
	Croup, Membranous	3	25	1	5.0	0	0	0	0		6	31	3	12.4	1	0	4	-3		8	43	3	8.2	4	1	7	-3
	Diphtheria	36	60	21	6.4	15	25	19	-4		31	55	18	6.8	11	19	13	-2		45	60	27	6.0	19	31	36	-17
	Diarrhea	99	92	91	2.5	32	160	50	-18		99	94	93	2.5	24	168	51	-27		99	83	82	3.3	21	176	71	-50
	Dysentery	64	68	43	4.8	14	77	30	-16		78	74	58	4.7	10	82	60	-50		66	63	41	5.1	4	75	45	-41
	Erysipelas	40	54	22	7.2	5	27	19	-14		35	60	20	7.6	5	18	20	-15		32	54	17	6.7	2	30	25	-23
	Fever, Intermittent	98	94	92	1.8	13	184	46	-33		96	95	91	1.9	25	171	41	-16		97	95	93	1.5	35	228	37	-2
	Fever, Remittent	74	84	62	3.3	16	102	43	-27		80	89	70	3.2	18	126	35	-17		79	90	72	2.5	28	167	29	-1
	Fever, Typhoid (Enteric)	18	57	10	6.9	2	12	13	-11		28	68	19	6.6	14	26	8	+6		36	72	26	6.5	22	49	13	+9
	Fever, Typho-malarial	39	54	21	6.1	0	44	14	-14		54	65	35	5.7	11	55	22	-11		71	72	51	4.8	31	111	24	+7
	Influenza	26	54	14	5.5	1	18	15	-14		41	76	31	4.4	7	43	22	-15		42	68	28	4.3	5	63	22	-17
	Measles	33	65	21	5.0	5	34	12	-7		16	59	10	7.0	3	12	10	-7		13	39	5	5.8	1	5	8	-7
	Neuralgia	70	76	53	5.1	6	103	32	-26		70	77	53	5.4	6	103	28	-22		69	72	50	4.8	11	117	31	-20
	Pneumonia	34	48	16	6.3	3	25	23	-20		29	46	13	7.3	2	28	12	-10		38	48	18	6.1	9	32	25	-16
	Puerperal Fever	10	32	3	9.0	2	4	2	0		8	38	3	8.5	0	3	3	-3		8	34	3	6.8	2	7	0	+2
	Rheumatism	83	76	63	5.4	6	104	50	-44		75	83	61	5.7	9	89	47	-38		78	79	61	5.1	14	120	49	-35
	Scarlatina	16	49	8	7.6	0	7	16	-16		13	58	7	6.4	1	4	11	-10		20	45	9	7.3	3	8	13	-10

Small-pox	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tonsilitis	45	62	28	5.6	8	50	19	-11	50	61	30	5.7	4	52	19	-15	58	62	36	5.7	5	78	32	-27
Whooping-cough	48	79	37	4.9	2	60	32	-30	50	70	35	5.0	0	57	21	-21	48	69	33	4.9	8	59	37	-29
	OCTOBER.†								NOVEMBER.†								DECEMBER.†							
Av. for Tab. Dis. Reptd. Pres.	44	73	32	4.6	8.2	55.9	16.9	-8.7	40	74	30	4.6	7.5	51.1	17.2	-9.7	43	72	31	4.6	8.6	61.9	21.1	-12.5
Brain, Inflammation of	16	48	8	6.9	4	6	9	-5	9	46	4	7.6	1	3	7	-6	7	44	3	8.4	0	6	3	-3
Bowels, Inflammation of	17	47	8	7.5	1	11	5	-4	17	49	9	5.8	5	14	6	-1	16	47	8	8.2	2	12	11	-9
Bronchitis	75	78	57	4.1	11	98	31	-20	80	84	67	3.4	18	126	28	-10	81	88	72	2.9	20	155	36	-16
Cerebro-spinal Meningitis	9	35	3	6.6	2	2	3	-1	4	36	1	7.7	0	1	1	-1	4	20	1	5.7	0	1	1	-1
Cholera Infantum	16	52	9	5.8	1	13	4	-3	8	46	4	8.0	0	8	2	-2	6	33	2	6.0	0	5	0	0
Cholera Morbus	25	47	12	6.4	2	18	6	-4	13	48	7	5.9	0	14	4	-4	17	37	6	6.8	3	9	2	+1
Consumption, Pulmonary	74	90	66	5.4	9	157	5	+4	75	91	68	5.6	11	156	12	-1	77	91	70	5.4	22	180	12	+10
Croup, Membranous	14	43	6	7.0	4	8	8	-4	17	46	8	7.5	3	12	6	-3	26	42	11	7.1	7	12	12	-5
Diphtheria	51	69	35	5.5	24	39	26	-2	53	67	36	4.6	17	53	21	-4	57	64	36	4.7	15	51	43	-28
Diarrhea	72	69	50	4.3	3	84	37	-34	48	56	27	5.2	7	42	19	-12	42	56	24	5.2	3	45	17	-14
Dysentery	30	52	16	5.8	1	20	17	-16	15	45	7	7.0	1	8	9	-8	10	56	5	6.9	1	14	3	-2
Erysipelas	41	55	22	6.4	5	35	17	-12	44	52	23	5.7	7	33	17	-10	52	55	28	6.3	10	47	23	-13
Fever, Intermittent	96	94	90	1.6	10	186	35	-25	89	89	79	2.2	7	143	56	-49	83	86	71	2.8	10	128	68	-58
Fever, Remittent	74	90	66	2.5	15	122	26	-11	61	81	50	3.2	12	79	31	-19	64	77	49	3.7	4	89	48	-44
Fever, Typhoid (Enteric)	33	69	23	5.5	11	31	18	-7	31	73	22	5.7	4	39	17	-13	25	72	17	6.4	4	33	14	-10
Fever, Typho-malarial	67	76	52	4.4	20	91	19	+1	39	77	30	5.5	8	43	23	-15	32	71	22	5.5	3	40	18	-15
Influenza	47	71	33	3.3	15	63	14	+1	65	73	48	2.7	19	76	16	+3	59	85	52	2.4	20	117	17	+3
Measles	11	41	4	5.3	0	11	1	-1	13	55	7	5.2	0	18	4	-4	19	48	9	5.3	2	15	10	-8
Neuralgia	80	80	64	4.5	19	118	26	-7	77	85	65	4.4	16	117	30	-14	84	81	69	3.9	19	147	35	-16
Pneumonia	41	58	23	6.5	4	44	17	-13	64	61	39	5.8	8	76	18	-10	77	64	49	5.0	15	106	29	-14
Puerperal Fever	9	46	4	7.0	4	7	3	+1	8	35	3	5.5	1	2	5	-4	4	33	1	4.0	1	3	1	0
Rheumatism	82	82	66	4.8	21	102	41	-20	84	86	72	4.6	19	111	46	-27	88	84	74	4.1	28	142	44	-16
Scarlatina	20	59	12	5.5	5	17	6	-1	28	61	17	7.1	8	13	18	-10	38	47	18	6.9	4	21	28	-24
Small-pox	0	0	0	0	0	0	0	0	1	50	1	10.0	1	0	1	0	0	0	0	0	0	0	0	0
Tonsilitis	64	66	44	4.6	9	78	28	-19	73	86	59	3.8	21	103	32	-11	84	75	63	3.4	16	143	27	-11
Whooping-cough	32	73	23	4.4	5	36	20	-15	29	77	23	5.1	0	38	17	-17	28	70	19	5.8	6	27	26	-20

TABLE 2.—CONTINUED.—_Diseases in the Upper-Peninsular, the North-Western, the Western, and the Bay-and-Eastern Divisions* of the State, by Year and Months,† in 1880.—Per Cent of Weekly Reports which Stated Presence of Diseases Named._[a]

Div.*	DISEASES.	Year 1880.†	Jan.†	Feb.†	Mar.†	Apr.†	May.†	June.†	July.†	Aug.†	Sep.†	Oct.†	Nov.†	Dec.†	Div.*	Year 1880.†	Jan.†	Feb.†	Mar.†	Apr.†	May.†	June.†	July.†	Aug.†	Sep.†	Oct.†	Nov.†	Dec †
Upper-Peninsular Division.*	Av. for Tab. Dis. Reported Pres.	27	44	38	43	49	58	53	45	55	36	41	50	56	North-Western Division.*	34	40	49	51	49	44	53	56	52	50	55	45	41
	Brain, Inflammation of	2	0	7	....	0	0	0	0	0	11	0	0	0		4	0	0	0	0	0	10	0	0	10	25	0	0
	Bowels, Inflammation of	24	50	0	47	17	0	40	38	63	22	0	13	0		9	8	0	20	0	0	20	13	0	10	25	0	10
	Bronchitis	56	75	79	73	67	73	60	25	0	33	38	50	50		59	67	43	50	50	50	90	63	25	40	63	71	90
	Cerebro-spinal Meningitis	1	0	0	7	0	0	0	0	0	0	0	0	0		2	0	0	0	0	0	0	0	0	10	13	14	0
	Cholera Infantum	12	0	0	....	0	0	10	25	100	44	0	0	0		25	0	0	0	0	25	90	100	50	30	0	0	10
	Cholera Morbus	13	0	0	7	0	0	0	50	100	33	0	0	0		25	0	0	0	0	13	80	100	63	40	0	0	10
	Consumption, Pulmonary	62	83	71	67	75	64	50	50	50	44	50	50	60		34	67	43	70	50	25	60	13	13	20	0	14	10
	Croup, Membranous	6	25	0	7	0	0	0	0	25	0	13	13	0		12	33	0	0	13	13	10	0	0	0	0	29	40
	Diphtheria	2	0	0	....	17	0	0	0	0	0	0	0	0		13	0	0	0	0	0	30	50	50	30	0	0	0
	Diarrhea	64	25	36	53	58	64	100	100	100	89	63	75	50		56	25	0	30	25	63	100	100	100	90	75	43	20
	Dysentery	18	0	0	7	0	0	40	75	88	44	13	0	0		35	25	0	20	25	25	40	75	100	60	25	14	10
	Erysipelas	23	8	14	13	33	36	30	13	50	44	0	13	30		28	42	0	10	25	50	40	25	25	20	50	14	30
	Fever, Intermittent	4	8	7	....	0	0	0	13	13	11	0	0	0		73	8	43	50	50	50	100	88	100	100	100	100	100
	Fever, Remittent	5	0	0	....	0	0	0	0	0	0	13	0	50		46	8	43	50	38	0	40	50	75	100	100	43	20
	Fever, Typhoid (Enteric)	14	0	7	....	0	0	0	0	25	44	38	50	40		13	33	0	0	0	0	0	0	25	50	25	14	0
	Fever, Typho-malarial	1	0	0	....	0	0	0	0	0	0	13	0	0		30	17	43	30	0	0	10	25	88	70	63	29	0
	Influenza	66	83	71	87	67	82	70	38	0	33	100	75	50		45	58	43	50	50	50	60	0	13	50	50	57	50
	Measles	18	0	7	....	25	55	20	25	0	11	50	25	10		4	0	43	0	0	0	0	0	0	0	0	0	10
	Neuralgia	67	75	79	67	67	64	50	25	50	44	88	100	90		89	67	57	100	100	88	90	75	100	90	100	100	100
	Pneumonia	43	8	43	60	75	55	50	50	25	22	38	25	50		45	50	71	100	88	50	10	13	13	40	13	43	50
	Puerperal Fever	1	0	7	....	0	0	0	0	0	0	0	0	0		8	33	0	0	0	0	10	25	13	0	0	0	0
	Rheumatism	74	58	79	80	75	91	70	50	50	56	88	75	100		78	67	43	50	50	63	100	100	88	90	100	100	90
	Scarlatina	16	0	0	....	0	27	0	0	13	11	13	75	80		0	0	0	0	0	0	0	0	0	0	0	0	0
	Small-pox	0	0	0	....	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0

	Tonsilitis	38	67	43	27	25	27	50	38	25	0	25	63	70		58	67	71	80	63	38	80	50	38	40	50	29	70
	Whooping-cough	36	8	14	....	33	55	100	100	100	56	13	0	0		22	0	0	0	63	63	50	50	13	10	0	0	20
WESTERN DIVISION.*	Av. for Tab. Dis. Reported Pres.	38	39	44	43	42	38	47	46	45	41	40	43	47	BAY-AND-EASTERN DIVISION.*	34	39	38	39	36	38	31	40	40	39	34	37	37
	Brain, Inflammation of	6	4	11	15	11	10	0	11	0	3	8	0	0		4	0	9	1	2	0	4	2	12	5	8	4	5
	Bowels, Inflammation of	15	4	11	18	14	17	14	26	21	20	0	15	16		10	9	2	3	9	7	4	21	39	9	6	8	7
	Bronchitis	70	83	93	94	79	73	80	63	33	40	58	50	80		71	89	87	90	57	63	58	48	57	55	73	86	80
	Cerebro-spinal Meningitis	3	4	0	6	7	10	0	4	0	0	0	0	0		1	0	0	0	0	0	0	0	2	3	8	0	0
	Cholera Infantum	22	0	0	0	0	10	34	74	79	53	15	4	0		16	0	0	1	0	0	8	63	69	44	2	4	0
	Cholera Morbus	30	17	15	21	18	20	46	59	67	47	19	23	12		19	6	0	0	0	0	19	71	71	42	12	4	8
	Consumption, Pulmonary	55	33	41	45	46	67	71	67	50	50	58	65	60		61	59	62	57	57	60	66	62	57	64	63	66	67
	Croup, Membranous	7	13	4	0	11	0	0	0	4	3	4	35	24		7	8	4	12	0	5	2	0	6	6	15	4	18
	Diphtheria	49	58	63	36	50	30	40	30	38	50	65	50	88		35	42	31	36	39	21	19	31	20	31	42	51	55
	Diarrhea	53	25	33	45	54	47	69	93	100	87	35	27	20		44	32	15	22	20	28	49	96	96	81	58	16	18
	Dysentery	32	4	19	30	25	27	40	67	54	47	27	19	20		14	2	4	0	4	2	8	38	53	38	6	4	3
	Erysipelas	37	38	41	58	39	33	34	41	29	20	27	19	60		21	28	15	26	20	35	13	13	11	19	19	21	22
	Fever, Intermittent	89	79	89	76	82	90	100	100	100	100	96	88	68		84	81	82	78	80	86	87	94	90	91	88	80	73
	Fever, Remittent	75	71	89	82	86	67	74	78	58	80	69	65	80		53	51	44	49	59	51	55	56	57	59	60	50	43
	Fever, Typhoid (Enteric)	13	0	0	3	11	13	14	11	4	27	19	31	20		6	2	2	0	2	0	0	0	6	23	15	10	8
	Fever, Typho-malarial	29	29	15	9	14	7	11	41	50	40	50	42	56		32	21	16	12	4	5	17	29	39	59	79	54	38
	Influenza	52	71	93	70	64	57	54	26	33	20	39	50	44		42	74	69	58	33	26	13	17	33	36	33	52	50
	Measles	22	21	22	21	32	13	31	26	29	13	12	15	24		15	21	16	14	15	28	34	12	8	3	4	14	20
	Neuralgia	81	83	81	85	89	77	83	81	71	67	88	85	88		71	68	73	77	76	67	66	65	71	73	67	72	73
	Pneumonia	46	50	70	82	79	60	17	19	13	10	23	54	80		46	75	75	72	63	65	38	15	12	22	17	46	47
	Puerperal Fever	7	0	4	6	4	7	23	4	0	0	23	0	8		4	4	0	12	0	0	0	2	6	6	2	6	2
	Rheumatism	64	79	63	73	57	60	74	52	54	43	62	73	76		75	91	87	70	70	70	68	62	73	69	69	86	85
	Scarlatina	26	21	41	12	29	20	20	37	13	20	39	31	36		14	17	13	16	15	19	0	8	8	8	15	24	25
	Small-pox	0.6	4	4	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
	Tonsilitis	65	88	93	70	75	60	63	33	33	57	65	85	64		53	57	58	61	50	41	47	42	49	55	44	70	78
	Whooping-cough	32	17	26	30	29	27	37	48	50	43	31	23	16		46	42	40	58	50	47	49	31	57	63	42	42	28

*, †, d. The footnotes to which these marks refer are printed on page 315.

TABLE 2.– CONTINUED.—*Diseases in the Central, the South-Western, the Southern-Central, and the South-Eastern Divisions* of the State, by Year and Months,† 1880.—Per Cent of Weekly Reports which Stated Presence of Diseases Named.*[d]

Div.*	DISEASES.	Year 1880.†	Jan.†	Feb.†	Mar.†	April.†	May.†	June.†	July.†	Aug.†	Sept.†	Oct.†	Nov.†	Dec.†	Div.*	Year 1880.†	Jan.†	Feb.†	Mar.†	Apr.†	May.†	June.†	July.†	Aug.†	Sept.†	Oct.†	Nov.†	Dec.†
CENTRAL DIVISION.*	Av. for Tab. Dis. Reported Pres..	30	33	38	33	30	30	31	32	36	33	31	31	30	SOUTH-WESTERN DIVISION.*	33	41	45	44	41	45	38	40	45	44	39	43	43
	Brain, Inflammation of	8	5	8	10	13	8	10	9	1	7	7	6	2		2	3	0	0	7	10	6	0	0	0	3	0	0
	Bowels, Inflammation of	11	11	12	16	10	9	17	16	13	10	4	0	7		6	11	0	5	17	13	9	4	0	9	0	0	0
	Bronchitis	53	69	74	73	51	38	43	31	43	42	47	56	62		56	67	88	77	62	61	62	32	31	32	43	50	49
	Cerebro-spinal Meningitis	1	5	0	1	3	3	0	0	0	0	0	2	2		0.3	0	0	2	0	0	0	0	0	0	0	0	0
	Cholera Infantum	10	3	0	2	0	0	5	31	36	28	9	0	0		7	0	0	0	3	0	18	29	31	6	0	0	3
	Cholera Morbus	15	4	1	3	3	5	20	49	51	31	7	2	5		17	0	0	2	3	6	35	68	62	29	3	4	9
	Consumption, Pulmonary	70	62	72	79	82	68	64	63	68	69	71	63	73		91	78	76	91	86	90	100	100	100	94	93	96	91
	Croup, Membranous	3	5	1	4	7	5	0	3	0	0	4	2	2		2	6	9	0	0	0	6	0	0	0	3	0	3
	Diphtheria	28	27	39	37	31	25	23	17	16	19	36	44	24		21	25	29	30	21	10	6	14	4	29	40	18	20
	Diarrhea	43	24	21	22	24	37	47	87	88	78	38	26	20		43	19	15	16	24	26	56	100	96	82	40	32	29
	Dysentery	15	4	0	0	1	4	15	40	58	40	13	6	0		13	6	6	2	0	0	18	39	58	26	10	7	0
	Erysipelas	14	11	15	18	22	26	19	16	10	3	7	9	11		26	19	15	19	31	39	35	29	15	21	30	36	26
	Fever, Intermittent	82	69	62	80	85	95	90	93	91	93	85	70	64		89	81	82	81	90	97	91	89	100	100	97	93	74
	Fever, Remittent	55	49	46	41	52	59	60	61	80	65	58	39	47		75	44	59	63	83	100	85	68	81	97	97	75	60
	Fever, Typhoid (Enteric)	20	19	29	13	3	4	2	16	32	40	38	37	25		7	6	9	0	0	0	0	14	23	26	10	4	0
	Fever, Typho-malarial	20	26	20	7	9	9	12	19	25	42	44	28	16		24	28	18	14	14	13	24	14	27	71	50	25	0
	Influenza	35	72	62	50	27	14	17	11	29	24	31	44	42		52	67	88	88	62	48	32	11	35	38	33	46	51
	Measles	17	4	5	12	40	49	43	27	7	1	0	0	7		13	0	12	16	34	16	12	21	19	24	0	0	0
	Neuralgia	52	69	71	69	49	55	49	39	46	35	44	43	42		72	61	62	81	76	81	79	71	54	53	80	71	86
	Pneumonia	39	61	67	63	43	33	26	16	9	18	24	43	60		37	61	79	72	69	29	9	4	15	9	13	21	37
	Puerperal Fever	4	0	4	1	10	14	6	3	4	1	0	2	0		1	0	3	0	0	0	3	0	0	0	0	0	0
	Rheumatism	60	68	75	73	57	55	49	56	58	54	58	65	49		80	89	79	77	72	81	85	79	69	74	80	86	91
	Scarlatina	16	22	20	19	21	23	26	3	4	8	4	22	11		15	56	56	23	24	0	0	4	0	0	3	0	0
	Small-pox	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0

	Tonsilitis	43	61	61	51	33	32	30	26	32	31	47	54	58		42	58	68	67	45	32	26	14	12	26	37	54	49
	Whooping-cough	31	42	53	41	37	27	37	40	26	18	16	19	0		35	44	50	44	59	65	47	36	23	24	3	14	6
SOUTHERN-CENTRAL DIVISION.*	Av. for Tab. Dis. Reported Pres.	29	32	34	33	36	32	27	32	36	33	29	30	29	SOUTH-EASTERN DIVISION.*	38	43	42	45	46	42	37	43	42	44	42	38	40
	Brain, Inflammation of	3	3	5	5	0	3	0	3	7	3	4	4	2		17	42	24	11	11	15	18	10	18	22	18	10	10
	Bowels, Inflammation of	9	8	1	2	4	11	8	18	18	15	7	10	2		27	33	33	23	29	26	33	23	28	30	28	23	23
	Bronchitis	71	92	99	87	78	73	56	45	62	56	67	72	71		67	92	82	89	92	56	56	53	30	34	55	83	94
	Cerebro-spinal Meningitis	4	0	3	3	0	1	1	7	8	10	6	3	1		1	0	3	0	0	3	4	0	5	0	0	0	2
	Cholera Infantum	11	1	1	0	0	0	7	38	45	29	9	1	1		19	0	0	0	0	0	13	65	65	40	20	10	6
	Cholera Morbus	18	3	1	1	0	7	12	64	69	41	10	0	2		26	3	9	9	8	5	29	85	60	48	23	18	10
	Consumption, Pulmonary	64	68	77	70	72	72	64	61	51	60	55	58	60		90	81	88	80	90	87	89	90	88	86	95	100	100
	Croup, Membranous	5	10	13	5	5	3	2	0	0	0	1	7	8		11	17	27	27	21	8	11	0	8	16	13	10	15
	Diphtheria	14	14	12	18	17	14	2	9	7	16	16	15	28		31	31	36	31	32	41	22	23	25	36	40	48	42
	Diarrhea	44	25	28	19	16	39	45	80	93	78	54	23	28		55	28	24	32	45	54	69	100	95	94	58	30	21
	Dysentery	14	7	3	2	1	4	7	38	43	39	15	0	1		26	11	3	11	21	10	16	33	78	60	33	15	15
	Erysipelas	26	29	32	34	37	25	21	21	27	13	24	25	26		35	36	36	43	55	49	33	25	25	28	35	25	35
	Fèver, Intermittent	87	72	73	67	86	99	99	93	99	99	99	86	77		83	58	67	68	76	100	98	100	90	94	90	75	71
	Fever, Remittent	54	46	47	41	49	46	51	57	74	78	66	51	51		55	22	30	34	50	67	71	78	83	72	65	40	35
	Fever, Typhoid (Enteric)	5	11	8	3	3	1	1	3	8	4	7	10	7		32	14	21	32	21	31	22	30	35	38	45	38	41
	Fever, Typho-malarial	18	17	22	9	0	0	7	12	20	48	40	18	20		30	22	21	25	16	13	11	28	65	62	55	20	17
	Influenza	36	44	62	52	46	30	11	9	45	30	18	35	49		51	78	76	68	63	49	24	18	20	18	50	70	83
	Measles	18	1	22	33	49	41	32	26	9	2	0	0	0		30	58	67	61	39	62	49	13	5	2	5	15	6
	Neuralgia	61	68	65	68	70	56	58	51	49	49	63	70	69		56	83	73	77	71	59	49	38	38	28	50	55	65
	Pneumonia	38	69	81	78	58	38	16	8	13	14	18	25	39		48	67	79	77	71	44	29	35	13	22	45	50	51
	Puerperal Fever	3	7	0	0	1	0	1	4	3	5	1	6	2		3	6	3	5	0	5	2	3	0	0	10	0	0
	Rheumatism	72	86	82	90	80	77	76	66	54	62	61	61	68		75	89	91	89	79	77	71	65	65	61	65	73	79
	Scarlatina	11	14	11	16	18	6	13	5	8	9	4	10	16		23	31	24	30	37	51	27	10	15	14	23	10	15
	Small-pox	1	0	0	5	4	6	0	0	0	0	0	0	0		0.4	0	0	0	0	0	0	0	0	0	0	5	0
	Tonsilitis	45	75	69	63	45	46	28	13	19	25	42	55	57		48	47	58	61	55	59	41	35	30	40	35	48	69
	Whooping cough	18	8	15	21	18	30	31	26	23	11	9	8	15		44	39	33	41	34	38	42	33	38	60	50	48	56

*, †, d. The footnotes to which these marks refer are given on page 315.

EXHIBIT 9.—*By Months and by Geographical Divisions of the State, the Names of Observers whose Weekly Reports of Diseases are Compiled in Tables 1, 2, 3, and 4, the Localities*[a] *for which they Report, and the Number of Reports received from each Observer.*

DIVISIONS AND LOCALITIES REPRESENTED AND PHYSICIANS WHO REPORTED. Health Officers in italics; those also Correspondents marked with a *.)	WEEKLY REPORTS IN 1880.—COMPILED ON PAGES 309-75.												
	YEAR 1880.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
ALL LOCALITIES	3,991	327	332	417	315	314	363	317	308	373	294	292	339
UPPER-PENINSULAR DIVISION†	*125*	*12*	*14*	*15*	*12*	*11*	*10*	*8*	*8*	*9*	*8*	*8*	*10*
Central Mine, George W. Orr, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Houghton, H. W. Jones, M. D.	51	4	4	5	4	4	5	4	4	4	4	4	5
Marquette, *George J. Northrop,* M. D.*	8	4	4	----	----	----	----	----	----	----	----	----	----
Marquette, H. S. Taft, M. D.	14	----	2	5	4	3	----	----	----	----	----	----	----
NORTHWESTERN DIVISION†	*106*	*12*	*7*	*10*	*8*	*8*	*10*	*8*	*8*	*10*	*8*	*7*	*10*
Cadillac, Carroll E. Miller, M. D.	4	4	----	----	----	----	----	----	----	----	----	----	----
Cadillac, *John Leeson, M. D.*	31	----	----	----	----	----	5	4	4	5	4	4	5
Cadillac, *J. M. Wardell, M. D.*	21	4	4	5	4	4	----	----	----	----	----	----	----
Manistee *L. S. Ellis, M. D.*	10	----	3	5	2	----	----	----	----	----	----	----	----
Manistee, *Geo. La Montagne, M. D.*	36	----	----	----	2	4	5	4	4	5	4	3	5
Traverse City, B. D. Ashton, M. D.	4	4	----	----	----	----	----	----	----	----	----	----	----
NORTHEASTERN DIVISION†	*16*	*4*	*4*	*5*	*3*	----	----	----	----	----	----	----	----
Alpena, Wm. P. Maiden, M. D.	16	4	4	5	3	----	----	----	----	----	----	----	----
WESTERN DIVISION†	*335*	*24*	*27*	*33*	*28*	*30*	*35*	*27*	*24*	*30*	*26*	*26*	*25*
Casnovia, Drs. Koon and Wheelan	6	----	----	----	----	----	----	----	----	----	2	4	----
Cedar Springs, C. S. Ford, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Drenthe, Henry Kremers, M. D.	45	4	4	5	4	4	5	4	4	5	4	2	----
Grand Haven, *J. N. Reynolds, M. D.*	19	4	4	5	4	2	----	----	----	----	----	----	----
Grand Haven, *A. Vander Veen,* M. D.*	52	4	4	5	4	4	5	4	4	5	4	4	5
Grand Rapids, A. Hazlewood, M. D.	50	4	4	3	4	4	5	4	4	5	4	4	5
Ludington, *A. P. McConnell, M. D.*	35	----	----	----	----	4	5	4	4	5	4	4	5
Muskegon, John P. Stoddard, M. D.	24	----	3	5	4	4	5	3	----	----	----	----	----
Muskegon, *O. C. Williams, M. D.*	52	4	4	5	4	4	5	4	4	5	4	4	5
NORTHERN-CENTRAL DIVISION†	*99*	*4*	*8*	*10*	*8*	*8*	*10*	*8*	*8*	*10*	*8*	*8*	*9*
Big Rapids, *Irus W. Badger, M. D.*	51	4	4	5	4	4	5	4	4	5	4	4	4
Roscommon, W. S. Washington, M. D.	48	----	4	5	4	4	5	4	4	5	4	4	5
BAY AND EASTERN DIVISION†	*648*	*53*	*55*	*69*	*46*	*43*	*53*	*52*	*51*	*64*	*52*	*50*	*60*
Bay City, W. R. Marsh, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
East Saginaw, *Barnum L. Cleveland, M. D.*	25	----	----	----	----	----	----	4	3	5	4	4	5
East Saginaw, Samuel Kitchen, M. D.	13	4	4	5	----	----	----	----	----	----	----	----	----
Lapeer, *H. McColl,* M. D.*	52	4	4	5	4	4	5	4	4	5	4	4	5
Lexington, A. M. Oldfield, M. D.	51	4	4	5	4	4	5	4	4	4	4	4	5
Port Huron, *James K. Farnum, M. D.*	26	----	----	----	----	----	----	4	4	5	4	4	5
Port Huron, G. A. Stockwell, M. D.	28	4	4	5	4	3	4	4	----	----	----	----	----
Port Huron, *E. P. Tibbals, M. D.*	13	3	3	4	3	----	----	----	----	----	----	----	----
Port Huron, A. A. Whitney, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Port Sanilac, J. M. Loop, M. D.	46	4	4	5	3	4	4	----	4	5	4	4	5
Saginaw City, *E. A. Herig, M. D.*	45	4	4	5	4	4	5	4	4	5	4	2	----
Saginaw City, N. D. Lee, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Saginaw City, *I. N. Smith, M. D.*	7	----	----	----	----	----	----	----	----	----	----	2	5
Thornville, J. S. Caulkins, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
West Bay City, *A. F. Hagadorn, M. D.*	26	----	----	----	----	----	----	4	4	5	4	4	5
West Bay City, J. W. Hauxhurst, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
West Bay City, *Ira E. Randall*, M. D.*	45	4	4	5	4	4	5	4	4	5	4	2	----
Zilwaukee, George Hendry, M. D.	11	2	4	5	----	----	----	----	----	----	----	----	----
CENTRAL DIVISION†	*840*	*74*	*76*	*94*	*67*	*73*	*81*	*70*	*69*	*72*	*55*	*54*	*55*
Charlotte, G. B. Allen, M. D.	39	3	4	5	3	3	4	3	4	4	4	2	----
Charlotte, *P. D. Patterson, M. D.*	12	4	4	4	----	----	----	----	----	----	----	----	----
Corunna, *John Babington, M. D.*	13	----	----	----	----	2	----	4	4	3	----	----	----
Corunna, *Almon G. Bruce, M. D.*	12	4	4	----	----	----	----	----	----	----	----	4	----
De Witt, G. W. Topping, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Elsie, E. V. Chase, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Greenville, *A. W. Nichols, M. D.*	18	----	----	----	2	4	5	4	3	----	----	----	----
Hastings, A. P. Drake, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Hastings, *J. C. Lampman, M. D.*	20	----	----	----	----	4	4	3	----	----	----	4	5
Howard City, J. R. Hathaway, M. D.	9	----	4	5	----	----	----	----	----	----	----	----	----

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[a] Health officers of cities are supposed to report for their cities only; the reports of other observers are not thus restricted in locality, but in many cases include the vicinity as well as the corporate limits of the place named.

* Health Officer and Correspondent. † For counties in each division, see Exhibit 1, page 257.

EXHIBIT 9.—Continued.

DIVISIONS AND LOCALITIES REPRESENTED AND PHYSICIANS WHO REPORTED. (Health Officers in Italics; those also Correspondents marked with a *.)	Weekly Reports in 1880.—Compiled on Pages 309-75.												
	Year 1880.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Central Division.†—*Continued:*													
Howell, C. V. Beebe, M. D.	43	4	4	5	4	4	5	4	4	5	4	----	----
Hubbardston, H. W. Browne, M. D.	41	4	4	5	4	4	5	4	4	5	4	1	----
Hubbardston, J. I. Northrup, M. D.	3	----	----	----	----	----	----	----	----	----	----	3	----
Ionia (H. of C.), W. F. Reed, M. D.	41	4	2	5	4	4	----	----	4	5	4	4	5
Ionia, *S. V. Romig, M. D.*	52	4	4	5	4	4	5	4	4	5	4	4	5
Ithaca, I. N. Monfort, M. D.	17	4	4	5	4	----	----	----	----	----	----	----	----
Lansing, *J. H. Wellings, M. D.*	52	4	4	5	4	4	5	4	4	5	4	4	5
Mason, *W. W. Root,* M. D.*	26	3	2	5	2	4	3	4	3	----	----	----	----
Muir, L. S. Stevens, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
North Lansing, O. Marshall, M. D.	42	4	4	5	4	4	5	4	4	5	3	----	----
Otisville, A. W. Nicholson, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Ovid, O. B. Campbell, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Vernon, D. C. Holly, M. D.	33	4	4	5	4	4	5	4	3	----	----	----	----
Webberville, R. B. Smith, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Southwestern Division.†	*388*	*36*	*34*	*43*	*29*	*31*	*34*	*28*	*26*	*34*	*30*	*28*	*35*
Cassopolis, F. Goodwin, M. D.	13	4	4	5	----	----	----	----	----	----	----	----	----
Dayton, Robert Henderson, M. D.	51	4	4	5	4	4	4	4	4	5	4	4	5
Mattawan, Thos. H. Briggs, M. D.	32	4	2	4	2	3	5	4	2	4	2	----	----
Niles, Simeon Belknap, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Niles, James S. Reeves, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Niles, *Irwin Simpson, M. D.*	52	4	4	5	4	4	5	4	4	5	4	4	5
Otsego, Milton Chase, M. D.	51	4	4	4	4	4	5	4	4	5	4	4	5
Paw Paw, Josiah Andrews, M. D.	51	4	4	5	3	4	5	4	4	5	4	4	5
St. Joseph, R. F. Stratton, M. D.	34	4	4	5	4	4	----	----	----	----	4	4	5
Southern-Central Division.†	*941*	*72*	*74*	*94*	*76*	*71*	*85*	*76*	*74*	*94*	*67*	*71*	*87*
Adrian, *A. M. Stephenson, M. D.*	32	4	4	5	4	4	5	4	2	----	----	----	----
Adrian, Robert Stephenson, M. D.	16	----	----	----	----	----	----	----	----	3	4	4	5
Albion, A. Mc D. Duncan, M. D.	9	4	4	1	----	----	----	----	----	----	----	----	----
Albion, Amos Crosby, M. D.	40	----	----	3	4	4	5	4	2	5	4	4	5
Ann Arbor, *John Kapp, M. D.*	15	4	4	5	2	----	----	----	----	----	----	----	----
Battle Creek, *S. S. French,* M. D.*	31	4	4	5	4	4	5	4	4	----	----	----	----
Blissfield, R. B. C. Newcomb, M. D.	22	----	----	----	----	----	----	----	4	5	4	4	5
Brooklyn, E. N. Palmer, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Centerville, Marden Sabin, M. D.	51	4	4	5	4	4	5	4	4	5	4	4	4
Clinton, A. W. Alvord, M. D.	50	4	4	5	4	4	5	4	4	5	2	4	5
Coldwater, *G. V. Voorhees, M. D.*	17	4	4	5	4	----	----	----	----	----	----	----	----
Coldwater, *L. A. Warsabo, M. D.*	12	----	----	----	----	----	----	4	4	4	----	----	----
Coldwater, L. H. Wurtz, M. D.	18	----	----	----	----	----	----	----	----	5	4	4	5
Hillsdale, *John W. Falley,* M. D.*	52	4	4	5	4	4	5	4	4	5	4	4	5
Hudson, A. R. Smart, M. D.	25	----	2	----	2	----	----	4	2	5	2	3	5
Jackson (Prison) E. L. Kimball, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Jackson, W. Worsfold, M. D.	39	4	4	5	4	4	5	4	4	5	----	----	----
Kalamazoo, W. B. Southard, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Marshall, H. L. Joy, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Marshall, *Jas. F. Smiley, M. D.*	29	----	----	----	----	3	5	4	4	3	3	4	3
Mendon, H. C. Clapp, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Mendon, Edwin Stewart, M. D.	51	4	4	5	4	4	5	4	4	4	4	4	5
Sturgis, Nelson I. Packard, M. D.	21	4	4	5	4	4	----	----	----	----	----	----	----
Three Rivers, C. W. Backus, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Union City, Nelson H. Claflin, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Ypsilanti, *Edward Batwell,* M. D.*	44	----	----	5	4	4	5	4	4	5	4	4	5
Southeastern Division.†	*493*	*36*	*33*	*44*	*38*	*39*	*45*	*40*	*40*	*50*	*40*	*40*	*48*
Detroit (Eastern District), Judson Bradley M. D.	39	----	----	----	4	4	5	4	4	5	4	4	5
Detroit, Leartus Connor, M. D.	4	4	----	----	----	----	----	----	----	----	----	----	----
Detroit, *Elisha Leach, M. D.*	16	----	3	5	4	4	----	----	----	----	----	----	----
Detroit, W. H. Rouse, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Milford, Robert Johnston, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Monroe, *A. J. Masecar, M. D.*	15	4	2	4	2	3	----	----	----	----	----	----	----
Monroe, *A. I. Sawyer, M. D.*	31	----	----	----	----	----	5	4	4	5	4	4	5
Northville, J. M. Swift, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Pontiac, *W. G. Elliott,* M. D.*	26	----	----	----	----	----	----	4	4	5	4	4	5
Trenton, Wellington Carlton, M. D.	50	4	4	5	4	4	5	4	4	5	4	4	3
Utica, G. G. Roberson, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Washington, Albert Yates, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5
Wyandotte, E. P. Christian, M. D.	52	4	4	5	4	4	5	4	4	5	4	4	5

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* Health Officer and Correspondent. † For counties in each division, see Exhibit 1, page 257.

TABLE 3.—*Exhibiting by Localities and by Divisions of the State, for the Year and for each Month of the Year 1880 (ending* **January** *1, 1881), Facts relative to the occurrence and the Order of Prevalence of Diseases in Michigan, as compiled from 3,991 Weekly Reports made by Health Officers of Cities and by Regular Correspondents of the State Board of Health,—stating for each Disease the Per Cent of Weeks it was reported Present where Present, and its Average Order of Prevalence when Present, thus indicating the Prevalence as regards Time, and also as regards Area so far as this is represented by the localities.—For the Year and for the Four Weeks ending* **January** *31, 1880.*

Line Number.	Divisions and Localities Represented, and Initials of Physicians who Reported.* (Health officers in italics; those also Correspondents marked with a*.)	Reports Received.	Brain, Inflammati'n of.		Bowels, Inflammati'n of.		Bronchitis.		Cerebro-Spinal Men'gitis.		Cholera Infantum.		Cholera Morbus		Consumption, Pulmonary.		Croup, Membranous.		Diphtheria.		Diarrhea.		Dysentery.		Erysipelas.		Fever, Intermittent.		Fever, Remittent.	
			Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	YEAR 1880:— All Localities ‖	a 3991	49	8.1	49	7.0	81	3.7	35	7.1	60	5.2	57	5.3	89	5.7	47	7.4	63	5.7	73	4.2	59	5.8	56	6.3	91	2.3	83	3.3
2	Upper-Peninsular Div. †	125	22	4.0	49	4.1	70	2.8	20	3.0	58	2.5	53	2.7	90	2.1	38	5.0	50	7.0	74	2.9	68	3.8	44	4.3	21	4.4	43	3.7
3	North-Western Div. †	106	29	5.3	27	5.4	79	4.1	29	7.5	75	5.4	60	5.0	55	7.5	42	6.1	78	4.3	76	4.3	56	5.6	43	7.0	95	2.3	72	3.5
4	Western Division †	335	40	10.9	54	10.2	88	5.1	43	11.5	69	6.7	64	6.9	93	8.1	42	9.0	77	7.4	77	5.9	70	7.6	66	8.3	93	1.9	88	2.5
5	Northern-Central Div. †	99	0	0	25	3.0	75	4.2	29	5.5	53	5.3	53	4.7	40	5.6	51	3.7	73	3.3	61	3.2	48	4.0	61	4.1	77	1.7	59	3.1
6	Bay-and-Eastern Div. †	618	32	8.5	39	6.7	87	4.1	24	8.0	62	4.9	59	5.9	82	6.2	38	7.6	58	5.3	68	4.5	56	6.1	50	6.3	92	2.0	86	3.9
7	Central Division †	810	54	7.5	53	7.0	79	3.6	33	7.4	51	5.7	48	5.1	89	5.9	36	6.3	59	5.3	70	3.6	57	5.1	52	5.6	91	2.2	80	3.4
8	South-Western Div. †	388	35	5.6	36	6.4	73	3.7	25	9.0	50	6.1	55	5.4	96	5.0	35	4.8	53	5.2	76	4.5	46	5.3	52	6.3	93	2.8	87	3.3
9	Southern-Central Div. †	941	41	6.4	43	5.5	88	3.1	43	6.0	54	4.6	57	4.7	92	5.5	45	5.9	54	5.6	77	3.8	57	5.0	59	5.9	93	2.0	87	3.3
10	South-Eastern Div. †	493	74	9.8	65	8.3	85	4.1	27	5.2	74	5.1	61	5.3	97	5.2	82	10.9	77	7.1	78	4.8	70	6.9	62	7.5	89	3.0	83	3.2
11	JANUARY 1880:— All Localities. ‖	327	57	9.7	47	8.2	92	3.1	63	4.5	31	4.3	45	6.5	88	5.6	49	6.3	66	5.0	58	5.9	37	7.2	56	6.3	84	3.4	81	4.3
12	UPPER-PENIN. DIV. †	12	0	0	50	3	75	2	0	0	0	0	0	0	83	2	75	4	0	0	38	4	0	0	25	3	25	7	0	0
13	Central Mine, G. W. O.	4	0	0	25	3	25	3	0	0	0	0	0	0	50	2	0	0	0	0	50	2	0	0	25	3	0	0	0	0
14	Houghton, H. W. J.	4	0	0	50	5	100	3	0	0	0	0	0	0	100	2	75	4	0	0	25	6	0	0	0	0	25	7	0	0
15	Marquette, *G. J. N.* *	4	0	0	75	2	100	1	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	NORTH-WESTERN DIV. †	12	0	0	25	6	100	3	0	0	0	0	0	0	100	7	100	3	0	0	38	4	75	5	63	6	25	4	25	5
17	Cadillac, C. E. M.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	7	0	0	0	0	25	3	75	5	50	6	25	4	0	0
18	Cadillac, *J. M. W.*	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	Traverse City, B. D. A.	4	0	0	25	6	100	4	0	0	0	0	0	0	100	5	100	3	0	0	50	4	0	0	75	6	0	0	25	5
20	NORTH-EASTERN DIV. †	4	25	4	25	4	100	3	0	0	25	4	0	0	50	4	0	0	0	0	25	4	0	0	50	4	50	5	25	4
21	Alpena, W. P. M.	4	25	4	25	4	100	3	0	0	25	4	0	0	50	4	0	0	0	0	25	4	0	0	50	4	50	5	25	4
22	WESTERN DIVISION. †	24	25	13	25	14	83	4	25	5	0	0	100	10	100	9	38	7	88	5	50	8	25	4	75	8	95	3	85	3
23	Cedar Springs, C. S. F.	4	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	6	100	1	0	0
24	Drenthe, H. K.	4	0	0	0	0	100	1	25	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	5	100	3	50	5
25	Grand Haven, *J. N. R.*	4	0	0	0	0	50	5	0	0	0	0	0	0	0	0	50	6	100	4	0	0	0	0	0	0	100	4	100	1
26	Grand Haven, *A. V.* *	4	----	----	----	----	75	3	----	----	----	----	----	----	----	----	----	----	50	3	25	6	25	4	----	----	----	----	75	4
27	Grand Rapids, A. H.	4	0	0	0	0	75	4	0	0	0	0	0	0	100	6	25	7	100	5	25	7	0	0	0	0	75	4	100	1
28	Muskegon, *O. C. W.*	4	25	13	25	14	100	5	0	0	0	0	100	10	100	12	0	0	100	7	100	11	0	0	100	13	100	1	100	2
29	NORTH'N-CENTR'L DIV. †	4	----	----	----	----	50	3	----	----	25	6	25	2	25	2	----	----	50	2	----	----	----	----	50	4	50	2	50	2
30	Big Rapids., *I. W. B.*	4	----	----	----	----	50	3	----	----	25	6	25	2	25	2	----	----	50	2	----	----	----	----	50	4	50	2	50	2

31	BAY AND EASTERN DIV.†	*53*	*0*	*0*	*31*	*10*	*96*	*3*	*0*	*0*	*0*	*0*	*75*	*7*	*78*	*6*	*33*	*8*	*63*	*4*	*65*	*7*	*25*	*11*	*50*	*7*	*93*	*3*	*96*	*5*
32	Bay City, W. R. M.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	5	25	6	50	6	100	7	0	0	0	0	100	1	100	6
33	East Saginaw, S. K.	4	0	0	25	16	100	2	0	0	0	0	0	0	75	8	0	0	100	5	50	9	0	0	75	11	100	7	100	11
34	Lapeer, *H. McC.* *	4	----	----	----	----	100	1	----	----	----	----	----	----	25	3	----	----	----	----	----	----	----	----	25	6	100	2	100	3
35	Lexington, A. M. O.	4	----	----	----	----	100	1	0	0	0	0	0	0	100	3	0	0	50	4	0	0	0	0	25	4	25	3	0	0
36	Port Huron, G. A. S.	4	----	----	----	----	75	4	0	0	0	0	0	0	25	5	0	0	0	0	50	4	0	0	0	0	100	2	75	1
37	Port Huron, *E. P. T.*	3	0	0	0	0	67	3	0	0	0	0	0	0	0	0	0	0	33	3	0	0	0	0	0	0	0	0	0	0
38	Port Huron, A. A. W.	4	0	0	0	0	100	2	0	0	0	0	75	7	100	7	0	0	0	0	0	0	0	0	0	0	100	1	0	0
39	Port Sanilac, J. M. L.	4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	50	3	----	----	----	----	----	----	----	----	----	----
40	Saginaw City, *E. A. H.*	4	0	0	25	13	100	3	0	0	0	0	0	0	100	9	25	12	50	7	75	11	25	11	50	10	100	6	100	6
41	Saginaw City, N. D. L.	4	0	0	50	7	100	4	0	0	0	0	0	0	50	7	50	7	100	2	0	0	0	0	25	7	100	2	0	0
42	Thornville, J. S. C.	4	0	0	0	0	100	4	0	0	0	0	0	0	0	0	0	0	75	4	50	7	0	0	0	0	100	3	0	0
43	West Bay City, J. W. H.	4	0	0	25	4	100	2	0	0	0	0	6	0	100	5	0	0	0	0	50	5	0	0	75	5	100	3	100	3
44	West Bay City, *J. E. R.**	4	0	0	0	0	100	7	0	0	0	0	0	0	100	5	0	0	50	5	0	0	0	0	75	7	100	1	100	5
45	Zilwaukee, G. H.	2	----	----	----	----	100	4	0	0	0	0	0	0	0	0	0	0	0	0	100	4	0	0	50	6	100	2	0	0
46	CENTRAL DIVISION.†	*74*	*40*	*9*	*44*	*8*	*94*	*3*	*100*	*4*	*50*	*4*	*43*	*7*	*85*	*6*	*33*	*4*	*65*	*4*	*53*	*5*	*27*	*5*	*53*	*6*	*82*	*3*	*86*	*4*
47	Charlotte, G. B. A.	3	67	11	100	11	100	1	0	0	0	0	0	0	100	15	0	0	67	13	100	8	0	0	0	0	100	6	100	8
48	Charlotte, *P. D. P.*	4	0	0	0	0	100	6	0	0	0	0	0	0	100	9	0	0	100	7	0	0	0	0	0	0	100	3	100	3
49	Corunna, *A. G. B.*	4	0	0	25	14	100	4	0	0	0	0	0	0	100	7	0	0	0	0	25	9	0	0	75	8	75	6	100	6
50	DeWitt, G. W. T.	4	0	0	0	0	100	1	0	0	0	0	0	0	100	8	----	----	0	0	25	9	0	0	0	0	75	8	0	0
51	Elsie, E. V. C.	4	0	0	0	0	0	0	0	0	50	4	0	0	0	0	0	0	0	0	25	3	0	0	0	0	100	2	50	2
52	Hastings, A. P. D.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	4	0	0	25	4	0	0	0	0	0	0	100	1	0	0
53	Howell, C. V. B.	4	0	0	0	0	100	2	100	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	Hubbardston, H. W. B.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	7	0	0	0	0	0	0	0	0	0	0	0	0	100	3
55	Ionia (H. of C.) W. F. R.	4	0	0	25	4	0	0	0	0	0	0	0	0	100	3	0	0	100	2	75	3	0	0	25	3	75	3	0	0
56	Ionia, *S. V. R.*	4	0	0	0	0	50	5	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	25	4	100	2
57	Ithaca, I. N. M.	4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	25	4	25	2	----	----	----	----	----	----	100	2	----	----
58	Lansing, *J. H. W.*	4	0	0	0	0	100	5	0	0	0	0	25	6	100	5	0	0	100	1	0	0	0	0	0	0	50	6	0	0
59	Mason, *W. W. R.*	3	33	8	67	6	100	4	0	0	0	0	67	7	33	8	0	0	0	0	100	5	33	8	100	7	100	2	100	6
60	Muir, L. S. S.	4	0	0	0	0	100	5	0	0	0	0	0	0	0	0	50	5	0	0	0	0	0	0	0	0	100	2	0	0
61	North Lansing, O. M.	4	----	----	25	4	100	2	0	0	0	0	0	0	100	3	25	4	75	3	50	4	25	4	0	0	100	3	0	0
62	Otisville, A. W. N.	4	0	0	0	0	100	1	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	25	2	25	4
63	Ovid, O. B. C.	4	0	0	0	0	100	2	0	0	0	0	0	0	25	4	0	0	0	0	0	0	0	0	0	0	0	0	100	2
64	Vernon, D. C. H.	4	----	----	----	----	100	1	0	0	0	0	0	0	0	0	0	0	0	0	50	2	0	0	0	0	100	1	100	2
65	Webberville, R. B. S.	4	25	5	0	0	75	4	0	0	0	0	0	0	25	4	0	0	25	3	25	4	25	4	25	5	100	2	75	3

[Continued on page 328.]

NOTE.—For comments on this table see page 306-7. For plan of marking the card reports see pages 305-6. Summaries made from this table are given on pages 326, 329; also in Tables 1 and 2, pages 312-23; and in Table 4 and Exhibits 10-25, on following pages.

ª Includes 16 reports received from the Northeastern Division, for only four months of the year.

* Health officer and correspondent. For names of observers, see Exhibit 9, pages 324-5.

† For counties in each division see Exhibit 1, page 257. The numbers in this line are an average for those localities, only, within the division, at which the disease was reported present at some time during the month.

‡ When less than the full number of reports for the month have been received from any Observer, the number against his name in the column "Per Cent of Weeks Present," for any disease, is the per cent which the number of weeks he reports the disease present is of the number of cards received from him. When less than 2 reports have been received from any Observer for a month of 4 weeks, or less than 3 for a month of 5 weeks, they have not been compiled. When for any week no statement has been made by an Observer, with regard to a disease, and for the other weeks it has been marked 0, the columns for that disease against his name have been left blank. For the purposes of this compilation, each month is made to end on the Saturday nearest the end of the calendar month. In compiling this table, a fraction less than one-half is rejected, a fraction equal to or greater than one half is counted as one.

§ The disease of which there were the most cases was to be marked 1 in order, on the cards; that of which there was the next greatest number of cases, 2; and so on. Diseases not present were to be marked 0. This column states the average order of prevalence only for those weeks the disease was reported present.

‖ The numbers in this line are statements not for all the localities represented, but for those in which the disease was reported present.

TABLE 3.—*Diseases, by Localities in Michigan, Four Weeks ending* **January** *31, 1880*—CONTINUED.

Line Number.	Divisions and Localities Represented, and Initials of Physicians who Reported. (Health Officers in Italics; those also Correspondents marked with a*.)	Reports Received.	Brain, Inflamm'n of.		Bowels, Inflamm'n of.		Bronchitis.		Cerebro-Spinal Men'gitis.		Cholera Infantum.		Cholera Morbus.		Consumption, Pulmonary.		Croup, Membranous.		Diphtheria.		Diarrhea.		Dysentery.		Erysipelas.		Fever, Intermittent.		Fever, Remittent.	
			Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
66	SOUTH-WESTERN DIV.†	*36*	*25*	*4*	*50*	*5*	*86*	*3*	*0*	*0*	*0*	*0*	*0*	*0*	*100*	*5*	*50*	*4*	*56*	*4*	*58*	*4*	*25*	*6*	*44*	*5*	*91*	*4*	*67*	*5*
67	Cassopolis, F. G.	4	----	----	50	5	50	5	----	----	----	----	----	----	100	4	----	----	50	2	----	----	25	5	----	----	75	3	----	----
68	Dayton, R. H.	4	25	4	50	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	3	0	0	50	4	100	2	50	2
69	Mattawan, T. H B.	4	----	----	----	----	100	6	0	0	0	0	0	0	100	5	0	0	75	2	0	0	0	0	25	4	0	0	0	0
70	Niles, S. B.	4	----	----	----	----	75	7	0	0	0	0	0	0	100	9	0	0	75	8	0	0	0	0	75	6	100	6	75	9
71	Niles, J. S. R.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	3	0	0	0	0	50	7	25	7	0	0	75	10	50	10
72	Niles, *I. S.*	4	----	----	----	----	100	1	----	----	----	----	----	----	100	6	----	----	----	----	----	----	----	----	----	----	100	2	25	3
73	Otsego, M. C.	4	0	0	0	0	75	2	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	100	2	0	0
74	Paw Paw, J. A.	4	----	----	0	0	0	0	0	0	0	0	0	0	100	4	50	4	0	0	25	3	0	0	25	4	75	4	100	3
75	St. Joseph, R. F. S.	4	0	0	0	0	100	1	0	0	0	0	0	0	0	0	0	0	25	3	0	0	0	0	0	0	100	2	100	2
76	SOUTH'N-CENTR'L DIV.†	*72*	*50*	*10*	*38*	*8*	*97*	*2*	*0*	*0*	*25*	*3*	*25*	*7*	*94*	*6*	*44*	*7*	*63*	*6*	*75*	*7*	*31*	*7*	*58*	*6*	*81*	*3*	*83*	*4*
77	Adrian, *A. M. S.*	4	0	0	0	0	100	1	0	0	0	0	0	0	75	3	50	4	0	0	25	5	0	0	100	4	75	1	0	0
78	Albion, A. M. D.	4	----	----	25	12	100	2	0	0	0	0	0	0	100	6	0	0	0	0	100	10	50	11	50	11	100	6	100	10
79	Ann Arbor, *J. K.*	4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	25	3	75	4	100	4
80	Battle Creek, *S. S. F.**	4	----	----	----	----	100	6	----	----	----	----	----	----	100	7	25	10	75	6	75	8	25	10	100	10	75	3	100	2
81	Brooklyn, E. N. P.	4	0	0	0	0	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	4	0	0
82	Centerville, M. S.	4	0	0	0	0	100	2	0	0	0	0	0	0	50	6	0	0	0	0	0	0	0	0	25	5	100	3	75	3
83	Clinton, A. W. A.	4	0	0	0	0	100	3	0	0	0	0	0	0	100	7	0	0	50	9	50	4	25	5	50	9	100	2	50	8
84	Coldwater, *G. F. F.*	4	0	0	0	0	100	2	0	0	0	0	0	0	100	8	25	9	0	0	0	0	0	0	0	0	100	5	0	0
85	Hillsdale, *J. W. F.**	4	0	0	50	5	100	4	0	0	0	0	0	0	0	0	75	4	75	2	100	4	0	0	100	3	75	3	100	2
86	Jackson (Pris.), E. L. K.	4	----	----	----	----	100	1	----	----	----	----	----	----	100	5	----	----	----	----	----	----	----	----	----	----	100	4	----	----
87	Jackson, W. W.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	4	0	0	50	7	0	0	0	0	0	0	0	0	0	0
88	Kalamazoo, W. B. S.	4	50	10	----	----	100	6	0	0	0	0	0	0	100	9	0	0	0	0	0	0	0	0	0	0	100	1	100	2
89	Marshall, H. L. J.	4	0	0	0	0	100	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	Mendon, H. C. C.	4	0	0	25	6	100	1	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	75	4	25	3
91	Mendon, E. S.	4	0	0	0	0	100	1	0	0	0	0	25	4	0	0	0	0	0	0	0	0	25	3	0	0	50	3	75	2
92	Sturgis, N. I. P.	4	0	0	0	0	50	2	0	0	25	3	0	0	100	3	0	0	0	0	0	0	0	0	25	3	50	2	0	0
93	Three Rivers, C. W. B.	4	----	----	50	10	100	2	0	0	0	0	25	9	100	9	0	0	0	0	100	8	0	0	0	0	100	1	100	5
94	Union City, N. H. C.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	6	0	0	0	0	0	0	0	0	50	6	100	1	0	0
95	SOUTH-EASTERN DIV.†	*36*	*94*	*12*	*100*	*14*	*92*	*4*	*0*	*0*	*0*	*0*	*25*	*7*	*91*	*5*	*75*	*9*	*69*	*9*	*63*	*8*	*100*	*17*	*65*	*8*	*88*	*5*	*100*	*9*
96	Detroit, L. C.	4	100	18	100	17	100	3	0	0	0	0	0	0	100	5	0	0	100	16	100	11	100	17	100	13	100	4	100	10
97	Detroit, W. H. R.	4	100	14	100	18	100	4	0	0	0	0	0	0	100	7	100	15	100	12	0	0	0	0	100	11	100	9	100	8
98	Milford, R. J.	4	----	----	----	----	100	3	----	----	----	----	----	----	25	4	----	----	25	4	----	----	----	----	50	5	100	2	----	----
99	Monroe, *A. J. M.*	4	----	----	----	----	50	5	0	0	0	0	0	0	100	5	50	3	0	0	0	0	0	0	25	6	0	0	0	0
100	Northville, J. M. S.	4	0	0	0	0	100	4	0	0	0	0	0	0	100	4	----	----	0	0	0	0	0	0	50	5	50	3	0	0
101	Trenton, W. C.	4	100	8	0	0	75	8	0	0	0	0	0	0	0	0	0	0	0	0	25	8	0	0	0	0	100	6	0	0
102	Utica, G G. R.	4	0	0	0	0	100	3	0	0	0	0	25	7	100	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	Washington, A. Y.	4	75	8	100	7	100	2	0	0	0	0	0	0	100	6	0	0	0	0	25	8	0	0	0	0	75	7	0	0
104	Wyandotte, E. P. C.	4	0	0	0	0	100	3	0	0	0	0	0	0	100	3	0	0	50	3	100	3	0	0	0	0	0	0	0	0

*, †, ‡, §, ‖. For references, see footnotes with these marks on page 327.

TABLE 3.—*Diseases by Localities in Mich., for Year 1880 and for the Four Weeks ending* **January** *31, 1880.*— CONTINUED.

LINE NUMBER.¶	Fever, Typhoid (Enteric,)		Fever, Typho-Malarial.		Influenza.		Measles.		Neuralgia.		Pneumonia.		Puerperal Fever.		Rheumatism.		Scarlatina.		Small-pox.		Tonsillitis.		Whooping Cough.	
	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	66	6.5	64	5.5	78	3.0	62	4.8	80	4.5	68	5.1	40	7.8	83	4.6	57	6.5	64	6.3	72	4.4	76	4.8
2	78	3.7	25	4.0	82	2.2	38	4.4	82	3.4	51	4.2	25	2.0	74	3.7	59	4.9	0	0	56	3.5	75	2.2
3	67	4.6	64	6.3	81	2.7	50	7.5	92	3.8	56	5.0	38	5.2	93	4 3	0	0	0	0	71	4.1	52	5.4
4	69	10.9	67	7.8	82	4.4	62	6.0	88	4.7	73	5.9	38	8.6	79	5.9	63	7.8	25	7.5	81	5.5	78	7.6
5	68	4.1	69	4.7	20	2.0	51	3.9	65	3.8	69	4.9	0	0	74	3.5	23	6.4	0	0	83	2.9	46	3.7
6	53	7.1	63	5.8	74	3.4	41	5.5	81	4 6	65	5.4	40	6.2	85	5.1	53	5.5	0	0	77	4.9	74	4.4
7	66	5.1	65	5.7	73	2.9	67	4 2	73	4 6	68	4.9	49	10.6	75	4.5	57	5.5	0	0	69	4.1	78	4.0
8	67	7.0	65	4.7	84	2.5	63	6.3	80	4.6	75	4.9	22	8.5	91	4.9	65	6.0	0	0	65	3.8	76	4.0
9	48	6.9	58	5.1	76	3.0	74	4.0	80	4.1	65	4.4	36	6.5	83	4.2	54	6.5	92	4.3	67	4.1	76	4.7
10	78	7.3	71	4.5	83	2.9	75	4.8	82	5.2	74	5.7	39	7.3	92	4.7	61	8.5	50	10.0	77	4.7	83	6.3
11	58	6.2	60	6.7	88	2.5	55	5.1	84	4.3	76	4.4	46	6.6	85	4.6	65	6.3	25	8.0	82	3.8	77	4.9
12	*0*	*0*	*0*	*0*	*83*	*2*	*0*	*0*	*75*	*3*	*25*	*1*	*0*	*0*	*58*	*4*	*0*	*0*	*0*	*0*	*100*	*2*	*25*	*4*
13	0	0	0	0	50	3	9	0	100	1	25	1	0	0	75	2	0	0	0	0	100	2	0	0
14	0	0	0	0	100	1	0	0	100	4	0	0	0	0	75	5	0	0	0	0	0	0	0	0
15	0	0	0	0	100	1	0	0	25	4	0	0	0	0	25	4	0	0	0	0	100	2	25	4
16	*100*	*6*	*50*	*5*	*88*	*2*	*0*	*0*	*100*	*3*	*50*	*3*	*50*	*5*	*100*	*5*	*0*	*0*	*0*	*0*	*100*	*5*	*0*	*0*
17	0	0	50	5	75	2	0	0	100	3	50	4	25	4	100	5	0	0	0	0	100	5	0	0
18	0	0	0	0	0	0	0	0	0	0	25	1	0	0	0	0	0	0	0	0	0	0	0	0
19	100	6	0	0	100	1	0	0	100	3	75	5	75	6	100	4	0	0	0	0	100	4	0	0
20	*25*	*5*	*50*	*2*	*100*	*1*	*0*	*0*	*100*	*3*	*0*	*0*	*0*	*0*	*100*	*3*	*0*	*0*	*0*	*0*	*75*	*3*	*0*	*0*
21	25	5	50	2	100	1	0	0	100	3	0	0	0	0	100	3	0	0	0	0	76	3	0	0
22	*0*	*0*	*58*	*9*	*85*	*3*	*63*	*7*	*83*	*5*	*60*	*4*	*0*	*0*	*79*	*6*	*42*	*4*	*25*	*8*	*88*	*5*	*100*	*7*
23	0	0	75	6	100	3	0	0	75	5	100	4	0	0	100	7	0	0	0	0	100	7	----	----
24	0	0	0	0	0	0	0	0	100	4	50	6	0	0	100	4	0	0	0	0	100	3	0	0
25	0	0	0	0	100	3	0	0	25	7	25	2	0	0	25	6	75	2	0	0	50	5	0	0
26	----	----	25	8	25	1	25	9	100	4	100	4	---	----	100	6	25	5	----	----	75	6	----	----
27	0	0	0	0	100	3	100	5	100	5	25	6	0	0	50	7	25	5	25	8	100	5	0	0
28	0	0	75	14	100	6	0	0	100	6	0	0	0	0	100	8	0	0	0	0	100	3	100	7
29	----	----	*75*	*4*	----	----	*25*	*5*	*25*	*6*	*100*	*3*	----	----	*75*	*2*	----	----	----	----	*75*	*2*	*25*	*5*
30	----	----	75	4	----	----	25	5	25	6	100	3	----	----	75	2	----	----	----	----	75	2	25	5
31	*25*	*6*	*44*	*7*	*87*	*3*	*37*	*6*	*88*	*4*	*75*	*5*	*25*	*8*	*91*	*5*	*60*	*6*	*0*	*0*	*91*	*4*	*76*	*5*

Continued on page 330.

	DISEASES REPORTED WHICH WERE NOT PRINTED ON THE BLANKS, AMOUNT OF SICKNESS, ETC.¶	Per cent of Weeks Present.‡	Av. Order of Prev. when Present.§
14	Pleuritis	50	7
19	Spasmodic croup	50	5
	Dropsy	25	5
21	Pleuritis	25	4
	Intussusception of bowels.	25	4
24	Cystitis	50	4
	Pharyngitis	25	6
	Indigestion	25	2
	Nephritis, Albu	25	6
	A good deal of coughs and colds, Jan. 24 and 31.		
30	Puerperal convulsions.	50	5
32	Neuralgia and rheumatism largely intermittent, Jan. 17.		
36	Sciatica	25	7
	Laryngitis very common, Jan. 17.		
	Laryngitis (Jan. 24)	25	1
	Neuralgia and rheumatism due to malarial causes, Jan. 17.		
40	Dyspepsia	75	4
	Spasmodic croup	25	10
41	A great deal of laryngitis with diphtheria, Jan. 10. Our cases of diphtheria in very many instances are taken with a little tonsillitis followed immediately or simultaneously with laryngitis, and these with all the characteristic symptoms of membranous croup, which is immediately followed by the diphtheritic deposit, on the tonsils and fauces generally, and is very fatal. No treatment, however persistent, seems to stay its progress in very many cases after the diphtheritic deposit has taken place. They must be cured in the first of the attack or not at all, and are often not seen until it is too late.—*Jan. 10, 1880.*—N. D. LEE, M. D., *of Saginaw City, Mich.*		

‡, § For explanations and references, see page 327. A fuller summary is given on pages 312-19.

¶ The several numbered lines on pages 329-31 continue statements for the localities and divisions which are named and have the same line-numbers on pages 326-8. On the right of the page the numbers before the notes are the line-numbers of the localities, on pages 326-8, to which the side-notes refer.

TABLE 3.—*Diseases by Localities in Mich., for Year 1880 and for the Four Weeks ending* **January** *31, 1880.*—CONTINUED.

LINE NUMBER.¶	Fever, Typhoid (Enteric.)		Fever, Typho-Malarial.		Influenza.		Measles.		Neuralgia.		Pneumonia.		Puerperal Fever.		Rheumatism.		Scarlatina.		Small-pox.		Tonsilitis.		Whooping Cough.	
	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
32	0	0	0	0	100	3	0	0	100	5	100	7	0	0	100	7	0	0	0	0	100	4	25	8
33	0	0	25	10	100	6	50	13	100	5	100	7	25	9	100	5	25	13	0	0	100	9	100	2
34	----	----	----	----	25	2	----	----	50	4	50	4	----	----	75	5	----	----	----	----	---	----	----	----
35	0	0	25	4	100	1	0	0	----	----	100	3	0	0	100	4	0	0	0	0	----	----	0	0
36	0	0	25	7	75	3	0	0	----	----	50	4	25	7	100	5	0	0	0	0	----	----	75	3
37	0	0	0	0	100	1	33	2	67	3	33	3	0	0	67	5	33	4	0	0	33	5	33	6
38	0	0	0	0	0	0	50	6	100	4	25	7	0	0	50	6	100	4	0	0	0	0	100	4
39	----	----	75	4	100	1	25	4	----	----	25	4	----	----	100	2	----	----	----	----	----	----	----	----
40	0	0	25	12	100	4	25	10	100	4	100	9	0	0	100	6	0	0	0	0	100	3	75	8
41	25	6	0	0	100	5	0	0	100	3	100	7	0	0	100	5	0	0	0	0	100	4	100	5
42	0	0	0	0	100	1	25	4	75	5	75	7	0	0	100	5	75	2	0	0	75	5	0	0
43	0	0	100	5	0	0	0	0	100	4	100	5	0	0	100	6	0	0	0	0	100	1	0	0
44	0	0	0	0	75	5	50	6	100	5	100	5	0	0	100	6	0	0	0	0	100	2	0	0
45	0	0	100	4	50	5	50	4	50	3	100	2	0	0	50	5	0	0	0	0	100	3	100	4
46	*58*	*6*	*73*	*7*	*91*	*2*	*43*	*9*	*82*	*4*	*83*	*4*	*0*	*0*	*76*	*5*	*70*	*7*	*0*	*0*	*78*	*4*	*79*	*4*
47	0	0	100	9	100	2	33	14	100	7	100	7	0	0	100	3	100	12	0	0	100	4	0	0
48	0	0	75	10	100	1	0	0	100	5	100	5	0	0	100	7	0	0	0	0	50	10	0	0
49	100	10	75	10	100	2	0	0	100	4	100	1	0	0	100	7	50	13	0	0	0	0	75	9
50	0	0	0	0	0	0	0	0	100	5	100	3	0	0	100	4	0	0	0	0	100	3	25	8
51	0	0	25	5	0	0	0	0	25	4	100	2	0	0	25	5	0	0	0	0	25	4	0	0
52	0	0	0	0	100	2	0	0	100	3	75	4	0	0	25	6	0	0	0	0	0	0	0	0
53	0	0	100	4	100	1	0	0	0	0	0	0	0	0	100	4	100	5	0	0	100	3	0	0
54	100	6	0	0	100	2	0	0	100	5	0	0	0	0	100	4	0	0	0	0	0	0	100	1
55	0	0	0	0	0	0	0	0	100	3	75	3	0	0	75	4	0	0	0	0	75	3	0	0
56	25	6	0	0	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	5	100	2
57	----	----	----	----	75	1	----	----	75	2	25	2	----	----	25	2	----	----	----	----	75	3	----	----
58	25	6	50	7	100	4	0	0	100	5	100	3	0	0	100	4	100	3	0	0	100	3	100	4
59	----	----	100	6	100	2	0	0	100	4	100	5	0	0	100	6	0	0	0	0	100	2	100	3
60	0	0	0	0	100	3	0	0	0	0	100	5	0	0	75	6	0	0	0	0	100	1	0	0
61	0	0	0	0	75	1	0	0	50	4	100	4	0	0	50	4	25	4	0	0	25	4	25	2
62	0	0	0	0	75	2	0	0	100	4	0	0	0	0	50	4	0	0	0	0	100	4	100	2
63	0	0	0	0	0	0	0	0	50	3	0	0	0	0	0	0	0	0	0	0	100	3	0	0
64	50	3	0	0	75	2	0	0	100	4	25	5	0	0	100	5	50	6	0	0	75	3	75	6
65	90	3	0	0	75	3	50	4	25	5	75	3	0	0	75	4	0	0	0	0	0	0	100	1
66	*50*	*5*	*63*	*5*	*86*	*2*	*0*	*0*	*69*	*4*	*92*	*4*	*0*	*0*	*89*	*5*	*100*	*4*	*0*	*0*	*75*	*3*	*80*	*4*
67	50	5	----	----	100	1	----	----	50	4	75	4	----	----	100	4	100	3	----	----	25	3	----	----
68	0	0	0	0	0	0	0	0	100	2	75	3	0	0	75	3	0	0	0	0	100	2	0	0
69	0	0	25	6	100	1	0	0	100	3	100	3	0	0	100	4	0	0	0	0	50	1	0	0

Line	DISEASES REPORTED WHICH WERE NOT PRINTED ON THE BLANKS, AMOUNT OF SICKNESS, ETC.¶	Per cent of Weeks Present.‡	Av. Order of Prev. when Present.§
43	You will observe that for January tonsilitis has predominated. Some physicians would have diagnosticated diphtheria instead, but in none of the cases was there *diphtheritic* membrane, although much pultaceous matter with excessive follicular secretion presented itself over the tonsils. I do not feel warranted in saying that any of them were diphtheria, although some were obstinate to remedies.—*Jan. 31, 1880.*—J. W. HAUXHURST, M. D., *West Bay City.*		
41	Cirrhosis of liver	100	5
49	The cases of rheumatism in children that I have treated this winter have presented about the same set of symptoms in every case. The child complains of an ordinary "cold" for a few days, next a "sore throat" is noticed, for which some domestic remedies are used, and generally in a day or two the feet become swelled and painful, and the child takes the bed and the doctor is sent for. None of these patients have been treated for diphtheria either before or since.—*Jan. 6, 1880.*—A. G. BRUCE, M. D., *Corunna, Mich.*		
	Spasmodic croup	100	6
50	Anemia	50	7
	Eczema	50	5
	Gonorrhea and heart diseases each	75	9
55	Pharyngitis	25	1
57	Parotitis	25	1
	Croup, mem., marked "diphtheritic," Jan. 10. See note Line 57 for Jan., p. 330.		
59	Cerebral anemia	33	8
	The cases of bronchitis follow whooping-cough, and some are fatal.—Jan. 19.		
60	Almost an epidemic of affections of the tonsils.—Jan. 10. 3 cases of open cancerous affections.—Jan 31.		
61	Influenza marked "diphtheritic," Jan. 24.		
64	Malaria masks everything.- Jan. 24		
	Jaundice	25	4

70	0	0	100	9	100	1	0	0	----	----	100	8	0	0	100	4	100	3	0	0	----	----	100	3	68	Heart disease	50	4
71	0	0	0	0	100	4	0	0	100	7	100	6	0	0	100	8	100	7	0	0	100	5	00	10		Gonorrhea	25	3
72	----	----	----	----	----	----	----	----	100	6	----	----	----	----	100	7	100	4	----	----	75	7	75	3		Peri-uterine cellulitis	50	3
73	0	0	0	0	100	2	0	0	25	4	0	0	0	0	100	4	0	0	0	0	0	0	0	0	69	Acute mania and peritonitis each	25	7
74	0	0	100	3	75	1	0	0	50	4	100	2	0	0	100	4	0	0	0	0	75	3	100	2	73	Cancer	25	5
75	0	0	25	3	25	3	0	0	25	3	0	0	0	0	25	3	100	3	0	0	100	1	25	2	74	Congestion of brain	25	3
76	*67*	*7*	*50*	*6*	*89*	*3*	*25*	*8*	*88*	*4*	*83*	*4*	*63*	*8*	*86*	*4*	*50*	*7*	*0*	*0*	*79*	*4*	*75*	*4*		Dyspepsia	50	3
77	0	0	0	0	100	4	0	0	50	4	25	5	0	0	100	3	0	0	0	0	50	5	0	0		Peritonitis	25	5
78	75	9	25	14	100	2	0	0	100	7	75	5	0	0	100	4	75	11	0	0	100	8	0	0		Cancer uteri	25	4
79	25	3	25	4	----	----	----	----	----	----	75	1	----	----	75	3	----	----	----	----	----	----	----	----		Gastralgia, stomatitis, cystitis, and		
80	100	8	25	2	75	7	----	----	100	10	75	9	----	----	100	8	----	----	----	----	100	5	75	1		spinal irritation, each	25	3
81	0	0	0	0	0	0	0	0	0	0	100	3	0	0	75	3	0	0	0	0	100	1	0	0		Epithelioma	25	4
82	0	0	0	0	100	2	0	0	100	4	50	5	50	6	100	3	0	0	0	0	75	3	0	0		Hemorrhoids	50	4
83	0	0	25	9	0	0	0	0	100	3	100	3	75	9	75	5	0	0	0	0	25	6	0	0	77	Parotitis	25	4
84	0	0	0	0	0	0	0	0	100	2	100	6	0	0	100	4	0	0	0	0	100	3	75	7	86	Syphilis	100	4
85	0	0	0	0	100	2	0	0	100	1	100	4	0	0	100	3	0	0	0	0	100	4	0	0	90	Pelvic cellulitis	25	3
86	----	----	----	----	----	----	----	----	----	----	----	----	----	----	100	3	----	----	----	----	100	3	----	----	91	Diabetes, each	25	3
87	0	0	0	0	100	1	0	0	100	6	100	4	0	0	100	5	75	7	0	0	25	5	0	0	93	Pharyngitis	25	7
88	0	0	100	7	100	3	25	8	0	0	100	5	0	0	100	8	0	0	0	0	100	4	0	0	97	Not much sickness; and genuineness of		
89	0	0	0	0	25	2	0	0	100	3	0	0	0	0	50	4	0	0	0	0	100	3	0	0		croup and diphtheria questioned, 4 weeks		
90	0	0	0	0	0	0	0	0	100	2	75	3	0	0	100	3	0	0	0	0	75	3	0	0		ending Jan. 31.		
91	0	0	0	0	0	0	0	0	50	4	75	3	0	0	25	3	0	0	0	0	75	3	0	0	100	Croup	25	4
92	0	0	0	0	0	0	0	0	25	3	100	1	0	0	50	3	25	4	0	0	25	3	0	0		Headache, periodical	25	3
93	0	0	0	0	100	3	0	0	100	5	100	8	0	0	100	6	25	10	0	0	100	8	0	0		Senile gangrene	25	6
94	0	0	100	2	0	0	0	0	100	4	0	0	0	0	100	4	50	5	0	0	100	2	0	0		Cystitis	50	4
95	*63*	*9*	*100*	*9*	*88*	*3*	*88*	*2*	*94*	*5*	*67*	*5*	50	5	100	4	55	8	0	0	85	4	88	9		Cystitis and stricture of urethra	50	4
96	0	0	100	15	100	8	100	1	100	6	100	11	0	0	100	6	100	12	0	0	100	4	100	11	103	Dyspepsia	100	4
97	100	13	0	0	100	2	100	2	100	10	100	5	0	0	100	6	100	16	0	0	100	2	100	17		Malaria	25	4
98	----	----	----	----	----	----	25	4	----	----	25	4	----	----	----	----	----	----	----	----	25	4	100	1		Pleuritis	25	7
99	0	0	100	3	75	4	0	0	100	5	100	2	0	0	100	6	25	7	0	0	0	0	0	0		Asthma and spasmodic croup, each	25	8
100	0	0	0	0	100	2	0	0	75	3	50	3	0	0	100	3	0	0	0	0	0	0	----	----	104	The diarrhea in the reports from Wyan-		
101	0	0	0	0	100	2	100	1	100	6	100	3	0	0	100	4	0	0	0	0	0	0	50	6		dotte, which is unusual in winter months,		
102	0	0	0	0	100	1	100	4	100	4	50	6	0	0	100	4	0	0	0	0	100	3	0	0		is owing to influx of new people upon		
103	0	6	0	0	100	3	0	0	100	5	25	8	0	0	100	3	25	3	0	0	100	5	0	0		whom the change of water usually pro-		
104	25	4	0	0	25	1	100	1	75	4	50	4	50	5	100	3	25	4	0	0	0	0	0	0		duces this effect after a few weeks.—E.		
																										P. C., *Feb. 2, 1880.*		

‡, § For explanations and references, see page 327. A fuller summary is given on pages 312-19.

¶ The several numbered lines on pages 329-31 continue statements for the localities and divisions which are named and have the same line numbers on pages 326-8. On the right of the page the numbers before the notes are the line-numbers of the localities, on pages 327-8, to which the side-notes refer.

LINE NO. 57.—An epidemic of influenza commenced here one week ago, and prevails extensively. I think there are rather less serious complications than usual. In this malarial district the first few cases gave rise to some difficulty in diagnosis, from the fact that the catarrhal symptoms were but feebly manifested in many cases. The salivary glands were quite often swollen among small children. There has not been as much bronchial irritation and more general *malaria* and pain in the limbs, and the attacks are lasting longer than usual. The outbreak was preceded by quite sharp cold weather, and quite changeable weather, and during good sleighing. The same atmosphere prevailed as during the epidemic of last winter. Domestic animals are not affected.—*Jan. 3, 1880.*—I. N. MONFORT, M. D., *Ithaca, Mich.*

Influenza has nearly subsided. Parotitis has prevailed to some extent during the past ten days, with no unusual complication or severity. Is now subsiding.—*Jan. 24, 1880.*—I. N. MONFORT, M. D., *Ithaca, Mich.*

Lee S. Cobb, of Nirvana, Lake Co., wrote: There is quite an amount of sickness at the village (Nirvana.) Dr. M., of Baldwin, Lake Co., attends them and pronounces two-thirds of the cases lung fever. I do not know it when I see it. I know some of them are taken with a "chill." I myself seem to be more subject to "colds" this winter than common. Ozone ranges from 1 to 5. There is but very little difference between the wet and the dry bulbs in the psychrometer. So far 2.50 inches of water and 1½ inches of snow has fallen this month.—*Jan. 16, 1880.*

During the last week in January an epidemic cold commenced a run in this vicinity.—F. D. PARMELEE, Hillsdale, *on Jan., 1880, Meteorological Register.*

TABLE 3.—CONTINUED.—*Diseases by Localities in Mich., Four Weeks ending* **February** *28, 1880.*

Line Number.	Divisions and Localities Represented, and Initials of Physicians who Reported.* (Health officers in italics; those also Correspondents marked with a.*)	Reports Received.	Brain, Inflammat'n of.		Bowels, Inflammat'n of.		Bronchitis.		Cerebro-Spinal M'n'gitis.		Cholera Infantum.		Cholera Morbus.		Consumption, Pulmonary.		Croup, Membranous.		Diphtheria.		Diarrhea.		Dysentery.		Erysipelas.		Fever, Intermittent.		Fever, Remittent.	
			Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.‡	Per cent of Weeks.§	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§
1	ALL LOCALITIES.........‖	332	47	8.6	49	8.4	89	3.1	38	4.5	25	4.0	46	6.8	91	5.9	47	7.1	67	5.6	57	6.4	37	6.9	56	6.3	85	3.6	86	3.9
2	UPPER-PENIN. DIV.....†	14	25	7	0	0	79	2	0	0	0	0	0	0	100	3	0	0	0	0	50	4	0	0	33	2	25	6	0	0
3	Central Mine, G. W. O.	4	0	0	0	0	25	2	0	0	0	0	0	0	0	0	0	0	0	0	50	3	0	0	25	2	0	0	0	0
4	Houghton, H. W. J.....	4	25	7	0	0	100	2	0	0	0	0	0	0	100	2	----	----	0	0	25	5	0	0	0	0	25	6	0	0
5	Marquette, *G. J. N.*....*	4	----	----	----	----	100	1	0	0	0	0	0	0	100	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Marquette, H. S. T.....	2	----	----	----	----	100	2	----	----	----	----	----	----	100	2	----	----	----	----	100	3	----	----	50	1	----	----	----	----
7	NORTH-WESTERN DIV..†	7	0	0	0	0	100	2	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	100	5	100	4
8	Cadillac, *J. M. W.*.....	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Manistee, *L. S. E.*......	3	0	0	0	0	100	2	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	100	5	100	4
10	NORTH-EASTERN DIV...†	4	0	0	0	0	100	2	0	0	0	0	0	0	50	5	0	0	0	0	0	0	100	5	50	5	50	5	0	0
11	Alpena, W. P. M.	4	0	0	0	0	100	2	0	0	0	0	0	0	50	5	0	0	0	0	0	0	100	5	50	5	50	5	0	0
12	WESTERN DIVISION....†	27	27	11	43	11	93	4	0	0	0	0	100	11	100	8	25	5	89	5	60	9	33	9	58	8	89	3	89	3
13	Cedar Springs, C. S. F..	4	0	0	0	0	100	6	0	0	0	0	0	0	0	0	0	0	0	0	25	8	0	0	100	7	100	1	50	3
14	Drenthe, H. K.	4	0	0	0	0	100	1	0	0	0	0	0	0	0	0	0	0	0	0	50	5	0	0	25	5	100	2	75	4
15	Grand Haven, *J. N. R.* .	4	0	0	0	0	100	3	0	0	0	0	0	0	0	0	25	5	75	6	0	0	0	0	0	0	100	3	100	2
16	Grand Haven, A. V.....	4	25	8	0	0	100	3	0	0	0	0	0	0	0	0	0	0	75	4	0	0	25	5	0	0	50	8	100	3
17	Grand Rapids, A. H.....	4	0	0	0	0	50	5	0	0	0	0	0	0	100	6	0	0	100	5	0	0	25	6	25	6	75	5	100	2
18	Muskegon, J. P. S......	3	33	10	67	12	100	5	0	0	0	0	0	0	100	8	0	0	100	6	67	12	67	13	100	10	100	1	100	2
19	Muskegon, *O. C. W.*....	4	25	14	25	9	100	8	0	0	0	0	100	11	100	11	0	0	100	6	100	11	25	13	50	13	100	1	100	2
20	NORTH'N-CENTRAL DIV.†	8	0	0	25	3	38	4	0	0	0	0	50	4	50	4	25	2	100	2	50	6	25	2	38	3	50	3	50	3
21	Big Rapids, *I. W. B.*....	4	0	0	0	0	25	6	0	0	0	0	50	4	50	4	0	0	100	2	50	6	0	0	50	4	50	3	50	4
22	Roscommon, W. S. W...	4	0	0	25	3	50	2	0	0	0	0	0	0	0	0	25	2	0	0	0	0	25	2	25	2	50	3	50	2
23	BAY AND EASTERN DIV.†	55	33	7	25	5	94	3	0	0	0	0	0	0	79	6	25	10	53	6	40	8	25	4	50	8	96	3	86	5
24	Bay City, W. R. M......	4	0	0	0	0	100	2	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	100	1	100	7
25	East Saginaw, S. K.....	4	0	0	0	0	100	7	0	0	0	0	0	0	100	9	25	12	100	9	25	12	0	0	25	13	100	9	100	10
26	Lapeer, *H. McC.*......*	4	----	----	----	----	100	1	----	----	----	----	----	----	75	6	----	----	25	5	----	----	25	5	50	5	100	1	100	3
27	Lexington, A. M. O....	4	----	----	----	----	100	1	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	Port Huron, G. A. S....	4	----	----	----	----	75	3	----	----	----	----	----	----	----	----	----	----	25	2	----	----	----	----	----	----	100	2	25	1
29	Port Huron, *E. P. T.*...	3	33	4	0	0	67	4	0	0	0	0	0	0	33	6	0	0	0	0	0	0	0	0	0	0	33	5	0	0
30	Port Huron, A. A. W...	4	0	0	0	0	100	3	0	0	0	0	0	0	100	6	25	8	0	0	25	8	0	0	0	0	100	1	0	0
31	Port Sanilac, J. M. L...	4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
32	Saginaw City, *E. A. H.*	4	25	13	0	0	100	4	0	0	0	0	0	0	100	11	0	0	75	10	75	11	0	0	0	0	100	6	100	8
33	Saginaw City, N. D. L.	4	25	5	25	5	100	4	0	0	0	0	0	0	25	5	0	0	25	4	0	0	0	0	0	0	100	2	0	0
34	Thornville, J. S. C......	4	0	0	0	0	100	4	0	0	0	0	0	0	0	0	0	0	50	5	0	0	0	0	100	7	100	3	0	0
35	West Bay City, J. W. H.	4	50	5	0	0	75	3	0	0	0	0	0	0	100	4	0	0	25	3	25	4	0	0	0	0	100	2	75	2
36	West Bay City, *I. E. R.**	4	0	0	0	0	100	2	0	0	0	0	0	0	100	5	0	0	100	7	0	0	0	0	0	0	100	2	100	4
37	Zilwaukee, G. H........	4	----	----	----	----	100	2	0	0	0	0	0	0	25	5	0	0	0	0	50	5	25	3	25	6	100	2	----	----
38	CENTRAL DIVISION.....†	76	75	8	50	8	82	3	0	0	0	0	25	7	86	6	25	3	71	5	62	6	0	0	55	6	78	4	83	4
39	Charlotte, G. B. A......	4	100	12	100	11	100	2	0	0	0	0	0	0	100	15	0	0	100	11	100	6	0	0	0	0	100	4	100	8
40	Charlotte, *P. D. P.*......	4	0	0	0	0	100	3	0	0	0	0	0	0	100	9	0	0	100	6	0	0	0	0	0	0	50	8	100	5
41	Corunna, *A. G. B.*......	4	0	0	25	14	100	3	0	0	0	0	0	0	100	11	0	0	50	13	50	12	0	0	50	12	100	6	100	6
42	DeWitt, G. W. T........	4	0	0	0	0	100	1	0	0	0	0	0	0	100	8	----	----	0	0	0	0	0	0	0	0	75	9	0	0
43	Elsie, E. V. C...........	4	0	0	0	0	25	4	0	0	0	0	0	0	25	4	25	3	25	3	0	0	0	0	50	3	50	1	50	2

44	Hastings, A, P. D.	4	0	0	0	0	50	4	0	0	0	0	0	0	100	4	0	0	25	4	0	0	0	0	0	0	100	3	0	0
45	Howard City, J. R. H.	4	----	----	----	----	100	4	0	0	0	0	25	7	75	8	0	0	100	4	25	6	0	0	75	6	100	3	0	0
46	Howell, C. V. B.	4	0	0	25	5	75	2	0	0	0	0	0	0	25	4	0	0	75	5	50	6	0	0	0	0	50	4	0	0
47	Hubbardston, H. W. B.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	7	0	0	0	0	0	0	0	0	0	0	50	6	0	0
48	Ionia (H. of C.) W. F. R.	2	0	0	0	0	50	4	0	0	0	0	0	0	50	3	0	0	100	3	0	0	0	0	100	4	100	2	0	0
49	Ionia, *S. V. R.*	4	0	0	0	0	50	4	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	0	0	100	3
50	Ithaca, I. N. M.	4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	75	2
51	Lansing, *J. H. W.*	4	0	0	0	0	100	5	0	0	0	0	0	0	100	5	0	0	100	2	0	0	0	0	25	5	0	0	0	0
52	Mason, *W. W. R.*	2	----	----	50	7	100	3	----	----	----	----	----	----	50	7	----	----	----	----	100	6	----	----	50	6	50	2	100	6
53	Muir, L. S. S.	4	0	0	0	0	100	4	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	100	3	0	0
54	N. Lansing, O. M.	4	50	4	0	0	75	4	0	0	0	0	0	0	100	3	0	0	100	4	0	0	0	0	0	0	100	2	0	0
55	Otisville, A. W. N.	4	0	0	0	0	100	1	0	0	0	0	0	0	100	4	0	0	25	4	0	0	0	0	0	0	25	5	50	2
56	Ovid, O. B. C.	4	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	2
57	Vernon, D. C. H.	4	----	----	----	----	100	2	0	0	0	0	0	0	0	0	0	0	0	0	100	4	0	0	0	0	100	1	100	2
58	Webberville, R. B. S.	4	0	0	50	4	100	4	0	0	0	0	0	0	100	3	0	0	0	0	25	4	0	0	0	0	100	2	50	4
59	SOUTH-WESTERN DIV.†	*34*	*0*	*0*	*0*	*0*	*88*	*4*	*0*	*0*	*0*	*0*	*0*	*0*	*100*	*6*	*38*	*6*	*71*	*4*	*42*	*5*	*25*	*5*	*42*	*5*	*88*	*4*	*100*	*5*
60	Cassopolis, F. G.	4	----	----	----	----	100	5	----	----	----	----	----	----	100	5	25	7	100	3	----	----	----	----	----	----	100	4	----	----
61	Dayton, R. H.	4	0	0	0	0	50	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	3	100	4
62	Mattawan, T. H. B.	2	----	----	----	----	100	5	0	0	0	0	0	0	100	5	0	0	100	2	0	0	0	0	0	0	0	0	0	0
63	Niles, S. B.	4	----	----	----	----	100	8	0	0	0	0	0	0	100	8	0	0	0	0	0	0	0	0	50	8	100	7	100	6
64	Niles, J. S. R.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	6	0	0	0	0	50	9	25	7	0	0	25	10	100	9
65	Niles, *I. S.*	4	----	----	----	----	100	1	----	----	----	----	----	----	100	6	----	----	25	8	----	----	----	----	----	----	100	2	100	4
66	Otsego, M. C.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	6	50	5	0	0	0	0	0	0	0	0	100	4	0	0
67	Paw Paw, J. A.	4	0	0	0	0	50	4	0	0	0	0	0	0	100	3	0	0	0	0	50	4	0	0	25	4	75	3	100	3
68	St. Joseph, R. F. S.	4	0	0	0	0	100	1	0	0	0	0	0	0	0	0	0	0	75	3	25	3	25	3	50	4	100	2	0	0
69	SOUTH'N-CENTRAL DIV.†	*74*	*100*	*12*	*25*	*10*	*99*	*3*	*50*	*4*	*25*	*4*	*25*	*5*	*98*	*6*	*50*	*7*	*45*	*7*	*70*	*6*	*50*	*11*	*67*	*7*	*93*	*3*	*92*	*4*
70	Adrian, *A. M. S.*	4	0	0	0	0	100	2	0	0	0	0	0	0	100	3	25	4	25	4	75	3	0	0	25	5	100	1	25	4
71	Albion, A. M. D.	4	0	0	25	10	100	2	0	0	0	0	0	0	100	6	0	0	25	10	100	9	50	11	100	9	100	6	0	0
72	Ann Arbor, *J. K.*	4	----	----	----	----	100	3	----	----	----	----	----	----	75	5	----	----	----	----	----	----	----	----	----	----	100	2	100	3
73	Battle Creek, *S. S. F.**	4	----	----	----	----	100	6	----	----	----	----	----	----	100	9	75	10	50	9	50	10	----	----	100	9	100	5	100	4
74	Brooklyn, E. N. P.	4	0	0	0	0	100	2	50	4	0	0	0	0	0	0	0	0	25	4	0	0	0	0	0	0	0	0	0	0
75	Centerville, M. S.	4	----	----	0	0	100	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	3	100	6
76	Clinton, A. W. A.	4	0	0	0	0	75	3	0	0	25	4	0	0	100	6	0	0	0	0	50	7	0	0	75	8	100	1	100	4
77	Coldwater, G. V. V.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	7	0	0	0	0	0	0	0	0	0	0	100	5	0	0
78	Hillsdale, *J. W. F.**	4	0	0	0	0	100	5	0	0	0	0	25	5	100	5	75	5	0	0	50	4	0	0	100	3	75	3	100	3
79	Hudson, A. R. S.	2	----	----	----	----	100	2	0	0	0	0	0	0	100	6	0	0	0	0	100	5	0	0	0	0	100	3	100	4
80	Jackson (Prls.) E. L. K.	4	----	----	----	----	100	1	----	----	----	----	----	----	100	4	----	----	----	----	50	3	----	----	----	----	100	3	----	----
81	Jackson, W. W.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	4	25	9	100	8	0	0	0	0	0	0	0	0	0	0
82	Kalamazoo, W. B. S.	4	100	12	0	0	100	5	0	0	0	0	0	0	100	11	0	0	0	0	0	0	0	0	0	0	100	1	100	4
83	Marshall, H. L. J.	4	0	0	0	0	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	5	0	0	0	0
84	Mendon, H. C. C.	4	0	0	0	0	100	1	0	0	0	0	0	0	100	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	Mendon, E. S.	4	0	0	0	0	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	4	100	3
86	Sturgis, N. I. P.	4	0	0	0	0	100	3	----	----	0	0	0	0	100	4	0	0	0	0	0	0	0	0	50	5	100	3	0	0
87	Three Rivers, C. W. B.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	9	0	0	0	0	100	9	0	0	25	9	100	2	100	5
88	Union City, N. H. C.	4	0	0	0	0	100	3	0	0	0	0	0	0	100	7	50	6	0	0	0	0	0	0	100	6	100	2	0	0
89	SOUTH-EASTERN DIV.—†	*33*	*50*	*9*	*69*	*9*	*93*	*3*	*25*	*5*	*0*	*0*	*38*	*7*	*100*	*6*	*100*	*10*	*71*	*7*	*67*	*5*	*33*	*10*	*67*	*7*	*81*	*4*	*67*	*3*
90	Detroit, *E. L.*	3	0	0	0	0	100	6	0	0	0	0	0	0	100	8	100	10	100	10	0	0	33	10	0	0	100	2	100	1
91	Detroit, W. H. R.	4	100	14	100	16	100	3	0	0	0	0	0	0	100	7	100	17	100	13	0	0	0	0	100	11	100	10	100	8
92	Milford, R. J.	4	----	----	----	----	100	4	----	----	----	----	----	----	100	5	----	----	----	----	----	----	----	----	----	----	100	2	----	----
93	Monroe, *A. J. M.*	2	0	0	0	0	50	4	0	0	0	0	0	0	100	6	100	4	100	3	0	0	0	0	100	6	0	0	0	0
94	Northville, J. M. S.	4	----	----	----	----	100	4	25	5	----	----	----	----	100	3	----	----	----	----	----	----	----	----	----	----	50	3	50	2
95	Trenton, W. C.	4	25	6	25	7	0	0	0	0	0	0	0	0	0	0	0	0	25	5	25	6	0	0	50	5	100	4	0	0
96	Utica, G. G. R.	4	25	7	50	7	100	2	0	0	0	0	50	6	100	6	0	0	0	0	0	0	0	0	75	6	0	0	0	0
97	Washington, A. Y.	4	50	8	100	7	100	1	0	0	0	0	25	8	100	6	0	0	0	0	75	7	0	0	25	8	25	7	0	0
98	Wyandotte, E. P. C	4	0	0	0	0	75	3	0	0	0	0	0	0	100	3	0	0	50	4	100	3	0	0	0	0	100	3	25	2

*, †, ‡, §, ‖. For these references, see footnotes on page 327.

TABLE 3.—*Diseases, by Localities in Michigan, Four Weeks ending* **February** *28, 1880.*—CONTINUED.

LINE NUMBER.¶	Fever, Typhoid (Enteric.)		Fever, Typho-Malarial.		Influenza.		Measles.		Neuralgia.		Pneumonia.		Puerperal Fever.		Rheumatism.		Scarlatina.		Small-pox.		Tonsillitis.		Whooping Cough.	
	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.‡	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Oder of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av Order of Prev.§
1	62	6.3	65	5.8	88	2.3	67	4.8	85	4.5	86	4.1	35	9.4	88	4.7	65	6.9	25	7.0	83	3.8	84	4.4
2	50	1	0	0	100	2	25	6	92	3	60	3	25	2	79	3	0	0	0	0	50	3	100	3
3	0	0	0	0	0	0	0	0	100	1	25	2	25	2	50	2	0	0	0	0	25	2	0	0
4	0	0	0	0	100	1	25	6	75	4	100	6	0	0	100	4	0	0	0	0	25	6	0	0
5	0	0	0	0	100	1	0	0	100	3	0	0	0	0	100	4	0	0	0	0	100	2	0	0
6	50	1			100	5					50	1			50	2							100	3
7	0	0	100	5	100	1	100	7	57	2	71	3	0	0	100	4	0	0	0	0	71	2	0	0
8	0	0	0	0	0	0	0	0	25	1	50	2	0	0	0	0	0	0	0	0	50	2	0	0
9	0	0	100	5	100	1	100	7	100	3	100	3	0	0	100	4	0	0	0	0	100	1	0	0
10	0	0	0	0	100	1	0	0	100	4	75	5	0	0	100	3	0	0	0	0	50	5	0	0
11	0	0	0	0	100	1	0	0	100	4	75	5	0	0	100	3	0	0	0	0	50	5	0	0
12	0	0	57	8	93	3	75	5	81	5	83	5	25	9	74	7	73	8	25	7	93	4	100	7
13	0	0	0	0	100	3	50	7	75	5	100	7	0	0	100	8	0	0	0	0	100	5	0	0
14	0	0	0	0	75	1	0	0	100	3	75	5	0	0	100	4	0	0	0	0	100	3	0	0
15	0	0	0	0	100	3	0	0	25	5	100	2	0	0	0	0	100	5	0	0	75	6	0	0
16	0	0	50	5	75	6	0	0	75	6	100	3	25	9	25	6	75	8	0	0	75	6	0	0
17	0	0	0	0	100	3	100	2	100	4	25	6	0	0	25	6	50	6	25	7	100	3	0	0
18	0	0	67	10	100	2	0	0	100	7	100	6	0	0	100	7	67	13	0	0	100	4	100	9
19	0	0	0	0	100	6	0	0	100	5	0	0	0	0	100	10	0	0	0	0	100	3	100	5
20	75	1	0	0	0	0	25	6	75	3	75	4	0	0	88	3	25	4	0	0	75	2	25	1
21	0	0	0	0	0	0	25	6	75	3	75	4	0	0	75	3	25	4	0	0	75	2	25	1
22	75	1	0	0	0	0	0	0	0	0	75	3	0	0	100	3	0	0	0	0	75	2	0	0
23	25	13	47	6	88	3	39	7	93	4	87	5	0	0	87	4	44	7	0	0	89	4	79	3
24	0	0	0	0	100	3	0	0	100	6	100	5	0	0	100	7	0	0	0	0	100	4	25	7
25	0	0	0	0	100	1	25	11	100	4	100	9	0	0	100	5	25	15	0	0	100	3	100	4
26					50	3			100	4	75	3			100	4								
27	0	0	0	0	100	2	0	0			75	4	0	0	100	4	25	4	0	0			0	0
28			25	4	100	2	75	3			50	4			50	4							75	2
29	0	0	33	7	100	1	67	3	100	3	33	5	0	0	67	4	0	0	0	0	0	0	0	0
30	0	0	0	0	25	6	25	6	100	4	0	0	0	0	25	6	75	5	0	0	0	0	100	2
31											100	2			100	1					25	3		
32	25	13	100	12	100	2	25	9	100	5	100	9	0	0	100	5	0	0	0	0	100	3	100	3
33	0	0	0	0	100	3	0	0	100	4	0	0	0	0	100	5	0	0	0	0	100	5	100	2
34	0	0	0	0	100	1	0	0	100	5	100	7	0	0	100	5	50	2	0	0	100	5	0	0
35	0	0	50	3	0	0	0	0	50	4	100	2	0	0	100	2	0	0	0	0	75	2	0	0
36	0	0	0	0	100	6	0	0	100	6	100	3	0	0	100	4	0	0	0	0	100	3	0	0
37	0	0	25	3	0	0	25	6	75	4	100	2	0	0	75	4	0	0	0	0	100	4	50	4
38	69	5	83	6	87	2	33	6	75	4	85	5	75	7	84	4	63	6	0	0	82	3	87	3
39	0	0	100	12	100	2	0	0	100	7	100	9	0	0	100	5	100	13	0	0	100	4	0	0
40	0	0	0	0	100	1	0	0	100	5	100	4	0	0	100	7	0	0	0	0	100	8	0	0
41	75	5	100	5	100	2	0	0	100	5	100	5	0	0	100	10	50	10	0	0	0	0	100	8
42	0	0	0	0	0	0	0	0	100	6	100	4	0	0	100	4	0	0	0	0	100	2	100	5
43	0	0	0	0	0	0	0	0	75	4	75	2	0	0	50	5	0	0	0	0	50	4	0	0

	DISEASES REPORTED WHICH WERE NOT PRINTED ON THE BLANKS, AMOUNT OF SICKNESS, ETC.¶	Per ct. of Wks. Present.‡	Av. Order of Prevalence.§
4	Croup	100	5
	Emphysema	100	7
	Pleuritis	25	7
5	Ophthalmia	100	2
9	Puerperal eclampsia	33	8
11	Gastritis	50	5
	Dyspepsia	25	4
22	Mumps and cystitis, each	50	3
24	Very little sickness, Feb. 7. Diphtheria almost gone in this region, Feb. 14. Very little change, Feb. 21 and 28.		
25	Chicken-pox	25	13
28	Cerebral anemia	50	6
	Diabetes, mel.	25	7
30	Apoplexy and asthma, each	25	7
32	Spasmodic croup	50	11
	Dyspepsia	75	7
34	Dropsy from scarlatina	25	5
35	Spasmodic croup	25	2
37	Paralysis	25	6
	Acute rheumatism	25	6
42	Spasmodic croup	100	7
	Heart disease and gonorrhea, each	75	9
	Eczema	75	5
	Abscess and dropsy, each	25	10
	Lithiasis	25	8
	Jaundice	50	9
	Dyspepsia	25	9
	Anæmia	50	6
46	Measles brought from Detroit.		
48	Pharyngitis	50	1
	Chicken-pox	50	5
53	Cancerous affections	25	6
57	Scarlatina occurs in sporadic cases.—Feb. 14.		
62	Peritonitis	100	7
66	Cancer	50	7
	Not much sickness, Feb. 14.		
67	Cancer of uterus	100	4
	Amenorrhea	50	4
	Perityphlitis, asthma, epilepsy, gastritis, periostitis, dyspepsia, each	25	4
	Chorea and eczema, each	25	3
75	Pneumonia of typhoid type, Feb. 28.		
78	Catarrhal fever	25	2
	A few cases of mumps, very mild, Feb. 14. For the last month there has been much catarrhal fever, mostly mild, a few severe		

44	0	0	0	0	100	1	0	0	100	3	0	0	0	0	100	5	0	0	0	0	25	4	0	0
45	25	9	0	0	0	0	0	0	100	4	100	6	0	0	100	5	0	0	0	0	100	2	50	6
46	75	5	75	6	100	1	25	6	25	6	50	5	75	7	50	5	50	5	0	0	100	3	----	----
47	100	6	0	0	50	1	0	0	100	4	0	0	0	0	100	4	0	0	0	0	50	3	75	2
48	0	0	0	0	0	0	0	0	100	3	100	3	0	0	100	2	0	0	0	0	100	3	0	0
49	0	0	0	0	100	1	50	5	0	0	50	5	0	0	0	0	0	0	0	0	0	0	100	2
50	75	2	50	2	----	----	----	----	50	2	----	----	----	----	100	1	----	----	----	----	----	----	----	----
51	100	5	0	0	75	4	25	6	75	4	100	4	0	0	100	4	100	2	0	0	100	3	100	3
52	----	----	100	7	100	2	----	----	100	4	100	4	----	----	100	4	----	----	----	----	100	2	100	3
53	0	0	0	0	100	1	0	0	25	4	100	4	0	0	100	5	0	0	0	0	100	2	0	0
54	0	0	0	0	100	2	0	0	25	5	100	4	0	0	75	4	25	4	0	0	0	0	50	3
55	50	6	0	0	0	0	0	0	100	3	0	0	0	0	25	3	0	0	0	0	0	0	100	2
56	0	0	0	0	50	3	----	----	50	4	25	5	0	0	0	0	0	0	0	0	75	2	100	4
57	0	0	0	0	50	6	0	0	100	4	100	4	0	0	100	4	50	5	0	0	100	4	100	1
58	50	5	0	0	100	3	0	0	25	4	75	4	0	0	25	3	0	0	0	0	50	4	75	2
59	*38*	*5*	*50*	*4*	*88*	*2*	*100*	*1*	*81*	*5*	*90*	*4*	*25*	*10*	*90*	*5*	*95*	*6*	*0*	*0*	*88*	*3*	*85*	*5*
60	50	5	----	----	100	3	100	2	75	6	100	4	----	----	100	5	100	3	----	----	100	5	----	----
61	0	0	0	0	100	1	0	0	75	4	100	5	0	0	25	6	0	0	0	0	100	5	100	1
62	0	0	0	0	100	1	0	0	100	4	100	3	0	0	100	4	0	0	0	0	50	1	----	----
63	0	0	50	7	100	1	0	0	----	----	100	6	0	0	100	4	100	8	0	0	100	3	100	7
64	0	0	0	0	100	2	0	0	100	6	100	4	0	0	100	7	100	8	0	0	100	4	100	10
65	----	----	----	----	25	5	----	----	100	8	----	----	25	10	100	6	100	8	----	----	----	----	100	3
66	0	0	0	0	100	2	0	0	100	4	25	4	0	0	100	5	0	0	0	0	0	0	0	0
67	25	4	25	4	100	1	0	0	25	4	100	2	0	0	100	4	0	0	0	0	50	4	25	3
68	0	0	75	2	75	1	0	0	0	0	100	3	0	0	0	0	75	2	0	0	100	1	0	0
69	*60*	*9*	*73*	*6*	*79*	*2*	*89*	*4*	*92*	*5*	*91*	*4*	*0*	*0*	*92*	*5*	*50*	*7*	*0*	*0*	*85*	*5*	*79*	*5*
70	0	0	0	0	75	3	0	0	0	0	75	3	0	0	100	4	50	4	0	0	50	4	0	0
71	75	11	0	0	100	1	0	0	100	8	100	6	0	0	100	5	0	0	0	0	100	6	0	0
72	----	----	----	----	25	5	----	----	----	----	100	2	----	----	----	----	----	----	----	----	----	----	----	----
73	25	10	----	----	100	1	----	----	100	10	100	7	----	----	100	9	----	----	----	----	100	5	100	2
74	0	0	0	0	0	0	0	0	0	0	100	2	0	0	100	2	0	0	0	0	25	5	0	0
75	0	0	0	0	100	2	0	0	100	4	100	6	0	0	100	4	0	0	0	0	100	5	0	0
76	0	0	25	9	0	0	0	0	75	4	100	3	0	0	100	7	25	8	0	0	0	0	0	0
77	0	0	0	0	50	1	0	0	100	2	50	7	0	0	100	5	0	0	0	0	100	4	0	0
78	0	0	75	5	100	3	50	4	100	1	100	3	0	0	100	3	0	0	0	0	0	0	0	0
79	100	6	100	5	100	1	100	3	----	----	100	2	0	0	100	4	0	0	0	0	----	----	100	5
80	----	----	----	----	25	1	----	----	75	6	----	----	----	----	100	5	----	----	----	----	100	3	----	----
81	0	0	0	0	100	1	0	0	100	6	100	4	0	0	100	6	100	7	0	0	100	4	0	0
82	0	0	100	8	100	2	100	8	0	0	100	4	----	----	100	9	0	0	0	0	100	5	50	9
83	0	0	0	0	100	1	0	0	50	4	50	3	0	0	50	4	0	0	0	0	100	4	0	0
84	0	0	0	0	75	3	0	0	100	3	100	2	0	0	100	5	0	0	0	0	100	5	0	0
85	0	0	0	0	50	1	0	0	100	4	75	3	0	0	25	3	0	0	0	0	100	3	0	0
86	0	0	50	3	0	0	100	2	0	0	100	1	0	0	0	0	0	0	0	0	25	5	0	0
87	0	0	0	0	100	4	0	0	100	5	100	5	0	0	100	7	0	0	0	0	75	7	0	0
88	0	0	100	3	0	0	100	1	100	5	0	0	0	0	100	6	25	7	0	0	100	3	75	3
89	*73*	*8*	*64*	*6*	*100*	*2*	*96*	*3*	*96*	*6*	*90*	*4*	*25*	*19*	*94*	*4*	*73*	*10*	*0*	*0*	*76*	*4*	*100*	*9*
90	100	9	100	8	100	2	100	3	100	6	100	7	0	0	100	4	100	8	0	0	100	7	100	9
91	100	12	0	0	100	2	100	5	100	9	100	5	25	19	100	5	100	16	0	0	100	1	100	17
92	----	----	----	----	----	----	100	3	----	----	----	----	----	----	50	5	----	----	----	----	----	----	100	1
93	0	0	0	0	100	5	0	0	100	8	100	2	0	0	100	8	0	0	0	0	50	5	0	0
94	----	----	----	----	100	1	----	----	----	----	75	4	----	----	100	3	----	----	----	----	----	----	----	----
95	0	0	75	6	0	0	100	3	100	3	100	2	0	0	100	3	0	0	0	0	50	7	0	0
96	0	0	0	0	100	1	75	4	100	4	100	5	0	0	100	4	0	0	0	0	100	3	0	0
97	0	0	0	0	100	2	0	0	100	6	75	5	0	0	100	3	25	7	0	0	100	3	0	0
98	25	4	25	3	100	1	100	1	75	3	75	3	0	0	100	4	0	0	0	0	25	4	0	0

cases, otherwise more than medium health. —Feb. 21. Catarrhal fevers still exist, but fewer and lighter.—Feb. 28.

80	Syphilis	100	4
81	Laryngitis	100	3
84	Peritonitis, hepatitis, each	25	7
86	Cerebro-spinal meningitis	50	4

87 Continues healthy, 3 weeks ending Feb. 21. Considerable sickness prevailing during past two weeks.—Feb. 28.

90	Parotiditis	100	10

91 Rather healthy, Feb. 7. Quite a number complaining of "colds," Feb. 28.

94	Congestion of liver	25	3
	Cystitis	25	5
	Senile gangrene	75	5

94 Influenza is severe and almost the only disease prevailing, Feb. 28.

97	Dyspepsia	75	4
	Asthma	75	7
	Spasmodic croup, malaria, each	25	7
	Pleuritis	50	8
	Hæmoptysis, puerperal convulsions, each	25	5

More cases of sickness in this vicinity than I ever knew before, and all of them are called either colds, pneumonia, or something of that nature.—LEE S. COBB, *Nirvana, Feb. 29, 1880.*

About 100 cases of "epidemic cold" in the month of February.—F. D. PARMELEE, *Hillsdale.*

Colds and lung diseases especially prevalent during the month.—I. N. MITCHELL, *Hastings, on Feb. Meteorological Register.*

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‡, § For these references, see page 327.

¶ The several numbered lines on these two pages continue statements for the localities and divisions which are named and have the same line-numbers on pages 332-3; on the right side of the page the numbers before the side-notes are the line-numbers of the localities, on pages 332-3, to which the side-notes refer.

TABLE 3—CONTINUED.—*Diseases, by Localities in Michigan*, **March**, *1880 (Five Weeks ending April 3.)*

Line Number.	Divisions and Localities Represented, and Initials of Physicians who Reported.* (Health officers in italics; those also Correspondents marked with a.*)	Reports Received.	Brain, Inflam-mat'n of.		Bowels, Inflam-mat'n of.		Bron-chitis.		Cerebro-Spinal M'n'gitis.		Cholera Infant-um.		Cholera Morbus.		Consump-tion, Pul-monary.		Croup, Membra-nous.		Diph-theria.		Diarrhea.		Dysen-tery.		Erysip-elas.		Fever, Intermit-tent.		Fever, Remit-tent.	
			Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks ‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§
1	ALL LOCALITIES........‖	417	47	7.9	38	7.4	90	3.2	28	10.0	20	6.0	30	5.4	86	5.6	51	7.6	60	5.8	55	5.9	44	6.6	56	6.3	85	3.1	78	4.0
2	UPPER PENIN. DIV......†	*15*	----	----	*70*	*5*	*73*	*2*	*20*	*3*	----	----	*20*	*5*	*100*	*2*	*20*	*6*	---	----	*80*	*2*	*20*	*3*	*40*	*4*	----	----	----	----
3	Central Mine, G. W. O.	5	0	0	80	3	20	3	20	3	0	0	0	0	0	0	0	0	0	0	60	1	20	3	0	0	0	0	0	0
4	Houghton, H. W. J.	5	----	----	60	6	100	1	----	----	----	----	----	----	100	2	20	6	----	----	----	----	----	----	----	----	----	----	----	----
5	Marquette, H. S. T.....	5	----	----	----	----	100	2	----	----	----	----	20	5	100	2	----	----	----	----	100	3	----	----	40	4	----	----	----	----
6	NORTH-WESTERN DIV..†	*10*	*0*	*0*	*20*	*6*	*100*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*70*	*5*	*0*	*0*	*0*	*0*	*60*	*7*	*40*	*7*	*20*	*9*	*100*	*5*	*100*	*3*
7	Cadillac, *J. M. W.*......	5	0	0	20	2	0	0	0	0	0	0	0	0	40	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Manistee, *L. S E.*......	5	0	0	20	9	100	1	0	0	0	0	0	0	100	7	0	0	0	0	60	7	40	7	20	9	100	5	100	3
9	NORTH-EASTERN DIV...†	*5*	*20*	*6*	*20*	*6*	*100*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*100*	*5*	*0*	*0*	*0*	*0*	*0*	*0*	*40*	*6*	*20*	*6*	*20*	*6*	*40*	*6*
10	Alpena, W. P. M........	5	20	6	20	6	100	2	0	0	0	0	0	0	100	5	0	0	0	0	0	0	40	6	20	6	20	6	40	6
11	WESTERN DIV...........†	*33*	*50*	*11*	*40*	*13*	*94*	*5*	*40*	*16*	*0*	*0*	*47*	*8*	*83*	*8*	*0*	*0*	*67*	*7*	*65*	*8*	*67*	*9*	*68*	*7*	*89*	*2*	*82*	*2*
12	Cedar Springs, C. S. F..	5	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	6	100	1	40	2
13	Drenthe, H. K............	5	0	0	0	0	100	2	0	0	0	0	0	0	0	0	0	0	0	0	60	4	0	0	40	5	100	1	60	4
14	Grand Haven, *J. N. R.*..	5	20	5	0	0	80	3	0	0	0	0	20	4	40	5	0	0	20	5	0	0	20	1	20	2	80	2	80	2
15	Grand Haven, A. V.....	5	0	0	20	7	80	5	0	0	0	0	20	8	0	0	0	0	0	0	20	6	0	0	0	0	0	0	100	2
16	Grand Rapids, A. H....	3	0	0	0	0	100	4	0	0	0	0	0	0	100	5	0	0	33	6	33	6	0	0	67	6	33	4	100	1
17	Muskegon, J. P. S.......	5	0	0	80	13	100	5	0	0	0	0	0	0	100	9	0	0	100	9	100	11	100	12	100	9	100	2	100	3
18	Muskegon, *O. C. W.*....	5	80	16	20	18	100	9	40	16	0	0	100	12	100	12	0	0	100	6	100	11	80	15	100	12	100	1	100	2
19	NORTH'N CENTR'L DIV..†	*10*	*0*	*0*	*0*	*0*	*60*	*3*	*0*	*0*	*0*	*0*	*20*	*5*	*40*	*6*	*0*	*0*	*100*	*5*	*40*	*4*	*20*	*2*	*70*	*3*	*80*	*2*	*70*	*3*
20	Big Rapids, *I. W. B*	5	0	0	0	0	100	3	0	0	0	0	20	5	40	6	0	0	100	5	60	6	0	0	80	4	100	2	60	4
21	Roscommon, W. S. W...	5	0	0	0	0	20	2	0	0	0	0	0	0	0	0	0	0	0	0	20	1	20	2	60	2	60	1	80	2
22	BAY AND EASTERN DIV †	*69*	*20*	*4*	*20*	*6*	*97*	*3*	*0*	*0*	*20*	*5*	*0*	*0*	*71*	*6*	*53*	*6*	*51*	*6*	*38*	*7*	*0*	*0*	*60*	*7*	*92*	*3*	*85*	*5*
23	Bay City, W. R. M.......	5	0	0	0	0	100	2	0	0	0	0	0	0	100	5	0	0	0	0	80	7	0	0	0	0	100	1	100	6
24	East Saginaw, S. K.....	5	0	0	0	0	100	4	0	0	0	0	0	0	100	8	0	0	100	11	60	11	0	0	0	0	60	11	60	12
25	Lapeer, *H. Mc C.**......	5	----	----	----	----	100	2	0	0	0	0	0	0	20	5	0	0	0	0	40	5	0	0	80	4	100	1	100	2
26	Lexington, A. M. O.....	5	----	----	----	----	100	2	0	0	0	0	0	0	100	2	0	0	20	4	0	0	0	0	0	0	0	0	0	0
27	Port Huron, G. A. S....	5	---	----	----	----	80	4	0	0	20	5	0	0	0	0	0	0	60	4	20	5	0	0	20	6	60	2	100	1
28	Port Huron, *E. P. T.*...	4	----	--	0	0	100	3	0	0	0	0	0	0	0	0	0	0	50	5	0	0	0	0	0	0	75	4	0	0
29	Port Huron, A. A. W...	5	0	0	0	0	100	2	0	0	0	0	0	0	100	5	0	0	20	6	0	0	0	0	60	6	100	1	0	0
30	Port Sanilac, J. M. L...	5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
31	Saginaw City, *E. A. H.*.	5	0	0	0	0	100	3	0	0	0	0	0	0	100	10	0	0	60	10	20	10	0	0	40	11	100	7	100	7
32	Saginaw City, N. D. L..	5	0	0	20	5	100	3	0	0	0	0	0	0	60	6	60	6	40	5	20	5	0	0	60	6	100	1	0	0
33	Thornville, J. S. C......	5	0	0	0	0	100	4	0	0	0	0	0	0	20	7	0	0	0	0	0	0	0	0	100	7	100	3	0	0
34	West Bay City, J. W. H.	5	0	0	0	0	80	2	0	0	0	0	0	0	40	3	20	5	40	3	20	3	0	0	0	0	100	1	60	2
35	West Bay City, *I. E. R.**	5	0	0	0	0	100	5	0	0	0	0	0	0	100	5	0	0	100	5	0	0	0	0	0	0	100	1	100	4
36	Zilwaukee, G. H........	5	20	4	20	6	100	3	0	0	0	0	0	0	40	6	80	6	20	4	40	8	0	0	0	0	100	3	60	6
37	CENTRAL DIVISION.....†	*94*	*45*	*6*	*43*	*6*	*87*	*3*	*20*	*14*	*20*	*7*	*20*	*5*	*88*	*6*	*27*	*6*	*59*	*5*	*53*	*4*	*0*	*0*	*57*	*5*	*84*	*3*	*72*	*4*
38	Charlotte, G. B. A......	5	100	12	100	12	100	2	20	14	0	0	0	0	100	15	0	0	100	12	100	6	0	0	0	0	100	5	100	9
39	Charlotte, *P. D. P.*......	4	0	0	0	0	100	4	0	0	0	0	0	0	100	9	0	0	75	8	0	0	0	0	0	0	75	7	100	6
40	De Witt, G. W. T.......	5	0	0	0	0	100	2	0	0	0	0	0	0	100	9	----	----	20	9	0	0	0	0	0	0	100	7	40	8
41	Elsie, E. V. C...........	5	0	0	0	0	0	0	0	0	20	4	0	0	0	0	0	0	60	3	20	4	0	0	0	0	100	2	60	2

42	Hastings, A. P. D.	5	0	0	0	0	100	2	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	100	1	0	0
43	Howard City, J. R. H.	5	0	0	40	9	100	4	0	0	20	9	0	0	40	8	40	9	100	6	0	0	0	0	80	6	100	3	0	0
44	Howell, C. V. B.	5	0	0	0	0	40	3	0	0	0	0	20	4	40	2	0	0	0	0	0	0	0	0	0	0	40	2	0	0
45	Hubbardston, H. W. B.	5	0	0	0	0	0	0	0	0	0	0	0	0	100	6	0	0	0	0	0	0	0	0	0	0	100	2	0	0
46	Ionia (H. of C.) W. F. R.	5	0	0	20	5	40	3	0	0	0	0	0	0	100	3	20	3	60	3	40	5	0	0	80	4	100	1	40	4
47	Ionia, *S. V. R.*	5	0	0	0	0	0	0	0	0	0	0	0	0	80	6	20	7	0	0	0	0	0	0	0	0	40	3	100	2
48	Ithaca, I. N. M.	5	40	4	40	3	60	3	----	----	----	----	----	----	80	2	----	----	20	1	40	1	----	----	----	----	40	2	----	----
49	Lansing, *J. H. W.*	5	0	0	0	0	100	5	0	0	0	0	20	7	100	5	0	0	100	2	0	0	0	0	20	7	0	0	0	0
50	Mason, *W. W. R.*	5	20	5	60	5	100	4	0	0	0	0	20	4	100	5	0	0	0	0	80	4	0	0	100	4	100	2	100	4
51	Muir, L. S. S.	5	0	0	0	0	100	4	0	0	0	0	0	0	80	5	0	0	0	0	0	0	0	0	0	0	100	3	20	3
52	North Lansing, O. M.	5	20	4	20	5	100	3	0	0	0	0	0	0	100	3	0	0	80	4	20	6	0	0	20	5	100	3	0	0
53	Otisville, A. W. N.	5	0	0	0	0	100	1	0	0	0	0	0	0	100	4	0	0	40	3	0	0	0	0	0	0	100	4	0	0
54	Ovid, O. B. C.	5	----	----	0	0	80	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	2	100	2
55	Vernon, D. C. H.	5	0	0	0	0	100	3	0	0	0	0	0	0	80	6	0	0	20	5	80	4	0	0	0	0	100	1	100	2
56	Webberville, R. B. S.	5	0	0	20	4	80	3	0	0	0	0	0	0	100	3	0	0	40	3	40	2	0	0	40	3	100	2	40	4
57	SOUTH-WESTERN DIV. †	*43*	*0*	*0*	*20*	*5*	*87*	*4*	*25*	*9*	*0*	*0*	*20*	*4*	*91*	*5*	*0*	*0*	*57*	*4*	*47*	*5*	*20*	*2*	*42*	*5*	*90*	*5*	*90*	*4*
58	Cassopolis, F. G.	5	----	----	----	----	100	3	----	----	----	----	----	----	100	3	----	----	80	2	----	----	----	----	20	4	100	2	----	----
59	Dayton, R. H.	5	0	0	20	7	0	0	0	0	0	0	0	0	100	6	0	0	0	0	0	0	0	0	0	0	100	5	100	3
60	Mattawan, T. H. B.	4	----	----	----	----	100	6	25	9	0	0	0	0	100	6	0	0	75	4	0	0	0	0	25	4	0	0	0	0
61	Niles, S. B.	5	0	0	0	0	80	11	0	0	0	0	0	0	100	7	0	0	0	0	0	0	0	0	100	10	100	8	80	7
62	Niles, J. S. R.	5	0	0	0	0	100	3	0	0	0	0	0	0	100	4	0	0	0	0	40	9	0	0	0	0	40	9	80	7
63	Niles, *I. S.*	5	----	----	----	----	100	1	----	----	----	----	----	----	100	7	----	----	----	----	----	----	----	----	----	----	100	2	100	3
64	Otsego, M. C.	4	0	0	0	0	100	3	0	0	0	0	0	0	100	6	0	0	50	5	0	0	0	0	0	0	100	4	0	0
65	Paw Paw, J. A.	5	0	0	0	0	20	4	0	0	0	0	20	4	80	3	0	0	40	4	60	3	0	0	0	0	80	3	80	2
66	St. Joseph, R. F. S.	5	0	0	20	3	100	1	0	0	0	0	0	0	40	3	0	0	40	3	40	2	20	2	20	3	100	3	100	3
67	SOUTH'N-CENTR'L DIV. †	*94*	*50*	*10*	*20*	*8*	*92*	*3*	*30*	*9*	*0*	*0*	*20*	*3*	*96*	*6*	*50*	*7*	*68*	*8*	*75*	*6*	*22*	*7*	*54*	*7*	*80*	*3*	*80*	*5*
68	Adrian, *A. M. S.*	5	0	0	0	0	100	2	0	0	0	0	0	0	40	4	0	0	0	0	0	0	0	0	0	0	100	1	40	3
69	Albion, A. M. D. & A. C.	4	0	0	0	0	100	3	0	0	0	0	0	0	100	3	0	0	0	0	50	5	25	4	25	8	100	4	50	7
70	Ann Arbor, *J. K.*	5	----	----	----	----	----	----	----	----	----	----	20	3	100	2	----	----	----	----	----	----	----	----	----	----	80	1	----	----
71	Battle Creek, *S. S. F.* *	5	----	----	----	----	100	5	----	----	----	----	----	----	100	8	----	----	100	10	100	10	20	10	100	9	100	2	100	5
72	Brooklyn, E. N. P.	5	----	----	0	0	40	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	Centreville, M. S.	5	0	0	0	0	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	7	100	4	100	3
74	Clinton, A. W. A.	5	0	0	20	10	100	4	40	8	0	0	0	0	100	7	0	0	60	7	40	4	0	0	60	9	100	1	100	7
75	Coldwater, G. V. V.	5	0	0	0	0	100	3	0	0	0	0	0	0	100	7	0	0	0	0	0	0	0	0	60	7	100	4	0	0
76	Hillsdale, *J. W. F.* *	5	0	0	20	5	100	4	0	0	0	0	0	0	100	5	60	4	0	0	80	4	0	0	100	3	100	3	80	3
77	Jackson (Pris.) E. L. K.	5	----	----	----	----	100	1	----	----	----	----	----	----	100	5	----	----	----	----	----	----	----	----	20	7	80	4	20	3
78	Jackson, W. W.	5	0	0	0	0	100	2	0	0	0	0	0	0	100	4	40	10	80	8	0	0	0	0	0	0	0	0	0	0
79	Kalamazoo, W. B. S.	5	80	15	0	0	100	4	0	0	0	0	0	0	100	13	0	0	80	13	0	0	0	0	80	11	100	1	100	7
80	Marshall, H. L. J.	5	0	0	0	0	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	7	0	0
81	Mendon, H. C. C.	5	0	0	0	0	100	1	0	0	0	0	0	0	100	6	0	0	0	0	0	0	0	0	20	6	20	3	0	0
82	Mendon, E. S.	5	0	0	0	0	100	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	3	20	3	100	2
83	Sturgis, N. I. P.	5	20	4	0	0	100	3	0	0	0	0	0	0	100	4	0	0	20	4	0	0	0	0	0	0	0	0	0	0
84	Three Rivers, C. W. B.	5	0	0	0	0	100	2	20	10	0	0	0	0	100	9	0	0	0	0	100	8	0	0	0	0	100	1	100	5
85	Union City, N. H. C.	5	0	0	0	0	100	3	0	0	0	0	0	0	100	6	0	0	0	0	0	0	0	0	40	9	100	2	0	0
86	Ypsilanti, *E. B.* *	5	----	----	----	----	20	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	4	60	3	0	0
87	SOUTH-EASTERN DIV. †	*44*	*100*	*12*	*50*	*11*	*89*	*4*	*0*	*0*	*0*	*0*	*40*	*5*	*90*	*6*	*86*	*12*	*63*	*7*	*56*	*8*	*100*	*11*	*66*	*8*	*88*	*4*	*63*	*3*
88	Detroit, *E. L.*	5	0	0	40	11	100	7	0	0	0	0	0	0	100	8	60	12	100	11	80	11	100	11	100	10	100	2	100	1
89	Detroit, W. H. R.	5	100	12	100	15	100	3	0	0	0	0	0	0	100	7	100	18	100	11	20	16	0	0	100	11	100	6	100	4
90	Milford, R. J.	5	----	----	----	----	100	3	----	----	----	----	----	----	20	4	----	----	----	----	----	----	----	----	----	----	100	2	----	----
91	Monroe, *A. J. M.*	4	0	0	0	0	100	6	0	0	0	0	0	0	100	7	100	5	50	6	0	0	0	0	75	7	75	3	25	2
92	Northville, J. M. S.	5	0	0	0	0	80	3	0	0	0	0	0	0	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	Trenton, W. C.	5	0	0	0	0	20	6	0	0	0	0	0	0	0	0	0	0	20	6	40	6	0	0	20	3	100	3	40	3
94	Utica, G. G. R.	5	0	0	20	8	100	3	0	0	0	0	40	7	100	7	0	0	0	0	0	0	0	0	80	6	0	0	0	0
95	Washington, A. Y.	5	0	0	40	6	100	1	0	0	0	0	0	0	100	6	0	0	0	0	40	7	0	0	20	8	40	8	40	6
96	Wyandotte, E. P. C.	5	0	0	0	0	100	2	0	0	0	0	40	2	100	3	0	0	40	3	100	2	0	0	0	0	100	3	0	0

*, †, ‡, §, ‖. For these references, see page 327.

TABLE 3.—*Diseases by Localities in Michigan* **March**, *1880, (Five Weeks ending April 3.)*—CONTINUED.

LINE NUMBER.¶	Fever, Typhoid (Enteric.)		Fever, Typho-Malarial.		Influenza.		Measles.		Neuralgia.		Pneumonia.		Puerperal Fever.		Rheumatism.		Scarlatina.		Small-pox.		Tonsillitis.		Whooping Cough.	
	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§	Per cent of Weeks.‡	Av. Order of Prev.§
1	48	6.4	46	5.7	80	2.3	57	5.2	83	4.2	79	4.0	37	6.6	89	4.3	50	6.8	100	5.0	78	4.1	78	4.5
2	----	----	----	----	*87*	*3*	----	----	*100*	*3*	*60*	*3*	----	----	*80*	*4*	----	----	----	----	*40*	*4*	----	----
3	0	0	0	0	60	2	0	0	100	2	20	3	0	0	80	2	0	0	0	0	60	2	0	0
4	----	----	----	----	100	1	----	----	100	4	100	4	----	----	100	5	----	----	----	----	20	5	----	----
5	----	----	----	----	100	5	----	----	----	----	60	3	----	----	60	4	----	----	----	----	----	----	----	----
6	*0*	*0*	*60*	*7*	*100*	*1*	*0*	*0*	*100*	*2*	*100*	*3*	*0*	*0*	*100*	*5*	*0*	*0*	*0*	*0*	*80*	*3*	*0*	*0*
7	0	0	0	0	0	0	0	0	100	2	100	1	0	0	0	0	0	0	0	0	60	2	0	0
8	0	0	60	7	100	1	0	0	100	2	100	4	0	0	100	5	0	0	0	0	100	3	0	0
9	*0*	*0*	*40*	*6*	*100*	*1*	*0*	*0*	*100*	*4*	*60*	*5*	*0*	*0*	*100*	*4*	*0*	*0*	*0*	*0*	*100*	*4*	----	----
10	0	0	40	6	100	1	0	0	100	4	60	5	0	0	100	4	0	0	0	0	100	4	----	----
11	*20*	*6*	*30*	*6*	*82*	*4*	*54*	*4*	*85*	*5*	*90*	*6*	*20*	*5*	*96*	*6*	*40*	*5*	*0*	*0*	*70*	*5*	*100*	*7*
12	0	0	0	0	100	3	60	5	80	7	80	7	0	0	80	6	0	0	0	0	100	5	0	0
13	0	0	0	0	0	0	0	0	100	3	80	4	20	3	100	3	0	0	0	0	60	4	0	0
14	20	6	0	0	80	4	20	3	20	5	80	2	20	7	0	0	40	5	0	0	20	6	----	----
15	0	0	20	2	20	6	0	0	100	3	100	3	0	0	100	4	40	5	0	0	60	5	0	0
16	0	0	0	0	100	2	100	4	100	5	0	0	0	0	0	0	0	0	0	0	33	5	0	0
17	0	0	40	10	100	2	0	0	100	7	100	6	0	0	100	6	0	0	0	0	100	7	100	9
18	0	0	0	0	100	5	0	0	100	5	100	14	0	0	100	9	0	0	0	0	100	4	100	5
19	*20*	*1*	*40*	*4*	*20*	*2*	*80*	*3*	*70*	*3*	*80*	*4*	*0*	*0*	*80*	*3*	*20*	*7*	*0*	*0*	*100*	*2*	*20*	*4*
20	0	0	40	4	0	0	80	3	80	4	80	4	0	0	100	3	20	7	0	0	100	2	20	4
21	20	1	0	0	20	2	0	0	60	2	0	0	0	0	60	2	0	0	0	0	100	2	0	0
22	*0*	*0*	*33*	*4*	*74*	*3*	*42*	*6*	*90*	*5*	*78*	*4*	*53*	*8*	*81*	*5*	*44*	*8*	*0*	*0*	*76*	*4*	*74*	*4*
23	0	0	0	0	100	3	40	8	100	6	100	7	0	0	100	7	0	0	0	0	100	4	100	7
24	0	0	0	0	100	1	60	11	100	3	100	6	100	13	100	4	60	14	0	0	100	9	100	5
25	0	0	0	0	40	3	0	0	80	4	100	3	0	0	100	4	0	0	0	0	60	5	0	0
26	0	0	0	0	20	3	0	0	20	3	20	4	0	0	0	0	0	0	0	0	20	2	20	1
27	0	0	40	5	20	3	20	3	----	----	80	3	20	6	0	0	0	0	0	0	20	2	100	3
28	0	0	25	1	100	3	25	4	100	4	50	3	0	0	100	6	0	0	0	0	0	0	25	4
29	0	0	0	0	0	0	0	0	100	5	0	0	0	0	40	5	80	5	0	0	0	0	100	3
30	----	----	60	1	----	----	----	----	----	----	20	2	----	----	20	1	----	----	----	----	----	----	20	3
31	0	0	20	11	100	2	60	4	100	7	100	7	0	0	100	7	20	11	0	0	100	7	100	2
32	0	0	0	0	100	2	0	0	100	3	100	4	0	0	100	4	40	6	0	0	100	3	100	3
33	0	0	0	0	100	1	0	0	100	5	80	7	0	0	100	6	0	0	0	0	80	6	80	2
34	0	0	20	3	0	0	0	0	100	3	60	2	40	5	60	2	0	0	0	0	80	2	0	0
35	0	0	0	0	100	6	0	0	100	6	100	3	0	0	100	2	0	0	0	0	100	3	0	0
36	0	0	0	0	40	3	0	0	80	5	100	1	0	0	60	7	20	4	0	0	80	5	60	6
37	*40*	*5*	*70*	*8*	*73*	*2*	*44*	*5*	*73*	*4*	*75*	*4*	*20*	*10*	*78*	*4*	*51*	*4*	*0*	*0*	*75*	*3*	*78*	*3*
38	0	0	100	11	100	3	0	0	100	8	100	7	0	0	100	5	40	12	0	0	100	1	0	0
39	0	0	0	0	100	1	0	0	100	3	100	2	0	0	100	4	0	0	0	0	75	6	0	0
40	0	0	0	0	0	0	40	10	100	6	100	3	20	10	100	5	0	0	0	0	100	4	100	1
41	0	0	0	0	0	0	0	0	20	6	100	2	0	0	20	4	0	0	0	0	60	4	----	----

	DISEASES REPORTED WHICH WERE NOT PRINTED ON THE BLANKS, AMOUNT OF SICKNESS, ETC.¶	Per cent of Weeks Present.‡	Av. Order of Prev. when Present.§
4	Croup	40	4
	Emphysema	80	7
	Pleuritis	20	6
8	Stomatitis	40	9
	Conjunctivitis	20	8
10	Dyspepsia	40	5
	Gastritis	20	6
13	Gastritis	20	5
20	Prurigo	20	3
21	Pleurisy	20	1
	Simple laryngitis	20	1
23	Mostly diseases of the air-passages. Not much change.—March 27.		
24	Chicken-pox	80	5
27	Peritonitis	20	4
30	Catarrh	40	1
31	German measles	20	9
	Dyspepsia	60	7
40	Croup	100	7
	Dropsy	100	10
	Gonorrhea	60	9
	Abscess	60	10
	Lithiasis	80	8
	Colic	20	10
	Mumps	40	7
	Waxy liver	40	7
46	Chicken-pox	80	4
48	Parotitis, 2 weeks ending Apr. 3.		
51	Almost an epidemic catarrhal affection of the air-passages, March 20.		
55	No prevailing diseases, Mar. 13.		
	Gastic catarrh	20	1
59	Gonorrhea	40	5
	Pericarditis	20	6
60	Acute mania	50	8
	Croup, pseudo	25	8
	Cystitis, scirrhus cancer, each	25	10
65	Cancer uteri	40	4
	Psoriasis, strangury, vulvitis, each	20	3
	Vaginitis	40	4
	Gastralgia	100	3
	Dyspepsia	40	2

42	0	0	0	0	100	1	0	0	60	3	40	3	0	0	20	4	0	0	0	0	0	0	0	0
43	20	8	0	0	0	0	0	0	100	3	60	2	0	0	100	6	0	0	0	0	100	4	40	9
44	0	0	0	0	80	1	0	0	40	4	40	3	0	0	40	3	40	2	0	0	0	0	0	0
45	40	6	0	0	40	1	0	0	100	3	20	4	0	0	100	3	20	6	0	0	40	3	100	3
46	0	0	0	0	0	0	0	0	100	3	80	4	0	0	100	2	0	0	0	0	80	4	0	0
47	0	0	0	0	80	2	100	4	20	4	0	0	0	0	60	6	0	0	0	0	0	0	100	3
48	100	2	----	----	----	----	----	----	60	3	----	----	----	----	100	1	----	----	----	----	----	----	40	2
49	20	6	0	0	100	4	20	5	100	4	100	5	0	0	100	5	100	1	0	0	100	3	100	5
50	0	0	40	5	80	3	0	0	100	2	100	4	0	0	100	4	0	0	0	0	100	2	60	2
51	0	0	0	0	100	1	0	0	60	2	80	4	0	0	80	5	0	0	0	0	60	5	0	0
52	40	6	0	0	40	1	20	3	20	4	100	3	0	0	60	4	80	2	----	----	----	----	----	----
53	20	5	0	0	0	0	40	4	100	4	0	0	0	0	100	4	0	0	0	0	0	0	60	2
54	0	0	0	0	20	2	0	0	40	3	40	4	0	0	0	0	40	4	0	0	20	3	80	4
55	0	0	0	0	· 20	4	0	0	100	4	80	5	0	0	100	4	40	4	0	0	80	3	100	2
56	0	0	0	0	100	1	0	0	0	0	60	3	0	0	20	2	0	0	0	0	60	2	0	0
57	*0*	*0*	*60*	*3*	*100*	*2*	*37*	*7*	*81*	*4*	*82*	*3*	*0*	*0*	*100*	*5*	*40*	*6*	*0*	*0*	*85*	*3*	*76*	*6*
58	----	----	20	3	100	1	60	3	100	4	100	2	----	----	100	4	----	----	----	----	20	4	----	----
59	0	0	0	0	100	2	0	0	100	4	40	6	0	0	0	0	0	0	0	0	100	4	100	1
60	0	0	0	0	100	1	0	0	100	3	75	3	0	0	100	4	0	0	0	0	100	2	0	0
61	0	0	100	3	100	6	40	10	60	5	100	4	0	0	100	4	20	7	0	0	100	3	100	9
62	0	0	0	0	100	2	20	10	100	8	100	3	0	0	100	7	80	10	0	0	100	4	40	10
63	----	----	----	----	----	----	----	----	100	5	----	----	----	----	100	6	40	8	----	----	----	----	100	4
64	0	0	0	0	100	1	25	5	100	3	25	4	0	0	100	5	0	0	0	0	0	0	0	0
65	0	0	0	0	100	1	0	0	60	3	100	3	0	0	100	3	20	4	0	0	80	3	40	4
66	0	0	0	0	100	2	0	0	20	3	100	1	0	0	0	0	40	2	0	0	100	2	0	0
67	*60*	*10*	*40*	*7*	*77*	*2*	*62*	*5*	*87*	*4*	*82*	*4*	*0*	*0*	*96*	*4*	*60*	*8*	*100*	*5*	*75*	*5*	*80*	*5*
68	0	0	0	0	0	0	0	0	40	4	80	3	0	0	100	3	80	4	0	0	20	3	0	0
69	0	0	20	3	100	1	0	0	100	4	100	3	0	0	100	3	0	0	0	0	100	3	0	0
70	----	----	----	----	----	----	----	----	----	----	80	2	----	----	----	----	----	----	----	----	----	----	----	----
71	60	10	----	----	100	2	60	10	80	10	100	3	----	----	100	7	----	----	----	----	100	5	100	5
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	1	0	0	0	0	60	2	0	0
73	0	0	0	0	100	1	0	0	100	5	100	4	0	0	100	3	0	0	0	0	80	6	0	0
74	0	0	0	0	0	0	0	0	100	4	100	2	0	0	80	6	20	10	0	0	0	0	0	0
75	0	0	0	0	80	4	20	7	100	3	80	8	0	0	100	5	20	8	0	0	100	3	0	0
76	0	0	20	5	100	2	20	4	100	1	100	3	0	0	100	3	0	0	0	0	20	4	0	0
77	----	----	----	----	40	2	40	5	100	5	40	8	----	----	100	3	----	----	----	----	100	3	----	----
78	0	0	0	0	100	1	60	7	100	6	100	5	0	0	100	5	80	8	0	0	100	3	0	0
79	0	0	80	12	100	2	100	8	0	0	100	4	0	0	100	9	100	10	0	0	100	6	100	4
80	0	0	0	0	100	1	0	0	100	4	60	3	0	0	100	5	0	0	0	0	100	5	0	0
81	0	0	0	0	40	2	0	0	100	3	100	3	0	0	100	4	0	0	0	0	100	5	0	0
82	0	0	0	0	20	3	20	3	60	3	20	4	0	0	100	3	0	0	0	0	60	4	60	3
83	0	0	0	0	0	0	100	1	20	3	100	2	0	0	60	3	0	0	0	0	40	4	0	0
84	0	0	0	0	100	3	0	0	100	5	100	6	0	0	100	6	0	0	0	0	80	8	0	0
85	0	0	40	8	0	0	100	1	100	3	100	5	0	0	100	6	0	0	0	0	40	8	40	10
86	0	0	0	0	20	3	100	1	0	0	20	3	0	0	80	2	0	0	100	5	0	0	100	5
87	*70*	*8*	*58*	*7*	*88*	*2*	*77*	*5*	*77*	*5*	*77*	*5*	*40*	*2*	*100*	*4*	*68*	*10*	*0*	*0*	*93*	*5*	*90*	*7*
88	100	10	100	9	100	3	100	7	100	5	100	8	0	0	100	4	100	9	0	0	100	7	100	9
89	100	11	0	0	100	2	100	15	100	9	100	6	0	0	100	9	100	17	0	0	100	1	100	14
90	----	----	----	----	----	----	40	2	20	4	40	4	----	----	----	----	----	----	----	----	----	----	100	1
91	0	0	25	6	100	4	0	0	100	10	100	1	0	0	100	8	50	7	0	0	100	11	0	0
92	0	0	0	0	100	1	0	0	20	4	60	4	0	0	100	3	0	0	0	0	0	0	60	3
93	40	5	0	0	0	0	80	2	100	4	60	4	0	0	100	2	0	0	0	0	0	0	0	0
94	0	0	0	0	100	1	80	3	100	4	100	5	0	0	100	4	20	5	0	0	100	3	0	0
95	0	0	40	8	100	4	40	6	100	5	80	8	0	0	100	2	0	0	0	0	100	5	0	0
96	40	4	60	3	20	2	100	1	60	3	60	2	40	2	100	2	0	0	0	0	60	3	0	0

68	Peritonitis	20	3
76	Catarrhal fever (Mar. 6)	20	4
	Catarrhal fever only about as a common cold, March 13. Sickness is and has been very light, except now and then a hard case. Measles were quarantined. Catarrhal fever has become too light to note.—March 20. Very healthy, April 3.		
77	Syphilis	100	3
78	Laryngitis, S.	100	3
82	Diabetes, mel.	40	4
84	Considerable sickness, 2 weeks ending Mar. 13. Less sickness, Mar. 20. Not much sickness, 2 weeks ending April 3.		
85	Measles very prevalent, March 6; abating, March 13.		
88	Parotiditis	100	10
89	Catarrhal difficulties most common, March 6. Diseases of respiratory organs as common as any, March 13. Healthy two weeks ending March 27. No prevailing sickness, April 3.		
92	Influenza very severe and almost epidemic, March 6.		
	Capillary bronchitis	20	3
	Pneumonia marked pleuro-pneumonia, March 6.		
94	Dyspepsia	20	2
95	Dyspepsia	100	3
	Malaria	40	7

NOTE FOR APRIL.

LINE-NO. 55, P. 341. Whooping-cough prevails in this whole township [Bertrand, Berrien Co.] Nearly all the children under 12 years have it, who have not had it previously. It is as to severity somewhat below the average, with exceptions here and there. It seems to have come from sections west of us, spreading slowly at first.—Apr. 13. Whooping-cough is very prevalent, and is getting serious to small children.—Apr. 17. Almost every family in this end of the township has whooping-cough.—Apr. 24.—ROBERT HENDERSON, M. D., *Dayton*.

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‡, § For these references, see page 327.

¶ The several numbered lines on these two pages continue statements for the localities and divisions which are named and have the same line-numbers on the two preceding pages; on the right side of the page the numbers before the side-notes are the line-numbers of the localities, on pages 336-7, to which the side-notes refer.

TABLE 3.—CONTINUED.—*Diseases, by Localities in Michigan,* **April,** *1880 (Four Weeks ending May 1, 1880).*

LINE NUMBER.	DIVISIONS AND LOCALITIES REPRESENTED, AND INITIALS OF PHYSICIANS WHO REPORTED.* (Health officers in italics; those also Correspondents marked with a*.)	Reports Received.	Brain, Inflammati'n of		Bowels, Inflammati'n of.		Bronchitis.		Cerebro-Spinal Men'gitis		Cholera Infantum.		Cholera Morbus.		Consumption, Pulmonary.		Croup, Membranous.		Diphtheria.		Diarrhea.		Dysentery.		Erysipelas.		Fever, Intermittent.		Fever, Remittent.	
			Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	ALL LOCALITIES.........‖	315	51	7.9	58	6.5	85	3.6	38	7.8	50	7.0	42	6.7	93	5.6	55	8.4	69	6 5	67	5.7	61	10.3	65	6.1	87	2.4	85	3.4
2	UPPER-PENIN. DIV.....†	12	0	0	50	6	100	3	0	0	0	0	0	0	75	2	0	0	50	7	88	3	0	0	50	5	0	0	0	0
3	Central Mine, G. W. O.	4	0	0	0	0	0	0	0	0	0	0	0	0	25	2	0	0	0	0	75	1	0	0	50	2	0	0	0	0
4	Houghton, H. W. J....	4	0	0	50	6	100	2	0	0	0	0	0	0	100	2	----	----	0	0	0	0	0	0	50	7	0	0	0	0
5	Marquette, H. S. T.....	4	----	----	----	----	100	4	0	0	0	0	0	0	100	2	0	0	50	7	100	5	0	0	0	0	0	0	0	0
6	NORTH-WESTERN DIV..†	8	0	0	0	0	100	3	0	0	0	0	0	0	100	9	25	9	0	0	50	6	50	7	50	7	100	3	75	2
7	Cadillac, *J. M. W.*.......	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Manistee, *L. S. E. & G. La. M.*..............	4	0	0	0	0	100	3	0	0	0	0	0	0	100	9	25	9	0	0	50	6	50	7	50	7	100	3	75	2
9	NORTH-EASTERN DIV..†	3	0	0	33	5	100	2	0	0	0	0	0	0	100	4	0	0	0	0	67	5	0	0	0	0	0	0	33	5
10	Alpena, W. P. M........	3	0	0	33	5	100	2	0	0	0	0	6	0	100	4	0	0	0	0	67	5	0	0	0	0	0	0	33	5
11	WESTERN DIVISION. ...†	28	75	14	100	12	79	4	50	16	0	0	63	12	81	8	38	6	70	8	94	9	88	12	92	10	82	2	86	3
12	Cedar Springs, C. S. F..	4	0	0	0	0	50	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	6	100	1	25	3
13	Drenthe, H. K..........	4	0	0	0	0	100	1	0	0	0	0	0	0	0	0	0	0	0	0	100	4	0	0	0	0	100	2	75	4
14	Grand Haven, *J. N. R.*.	4	0	0	0	0	25	7	0	0	0	0	0	0	0	0	25	6	100	6	0	0	0	0	0	0	100	2	100	2
15	Grand Haven, A. V....	4	----	----	----	----	75	3	----	----	----	----	----	----	25	7	----	----	75	6	75	7	----	----	----	----	25	6	100	3
16	Grand Rapids, A. H.. ..	4	0	0	0	0	100	5	0	0	0	0	0	0	100	5	50	6	25	5	0	0	0	0	0	0	50	2	100	1
17	Muskegon, J. P. S... ..	4	75	14	105	12	100	2	0	0	0	0	25	12	100	9	0	0	75	12	100	11	100	9	100	8	100	3	100	4
18	Muskegon, *O. C. W.*.....	4	0	0	0	0	100	7	50	16	0	0	100	11	100	13	0	0	75	9	100	12	75	14	100	15	100	1	100	2
19	NORTH'N-CENTR'L DIV.†	8	0	0	0	0	100	5	50	7	0	0	0	0	75	6	0	0	100	3	25	4	25	7	63	4	100	2	38	3
20	Big Rapids., *I. W. B.*...	4	----	----	----	----	100	5	50	7	----	----	----	----	75	6	----	----	100	5	25	4	25	7	100	6	100	2	25	4
21	Roscommon, W. S. W..	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	1	0	0	0	0	25	2	100	2	50	2
22	BAY AND EASTERN DIV.†	46	25	11	50	6	93	3	0	0	0	0	0	0	76	6	0	0	58	5	45	6	50	9	41	4	88	2	87	3
23	Bay City, W. R. M......	4	0	0	0	0	100	2	0	0	0	0	0	0	100	5	0	0	100	6	100	6	0	0	0	0	100	1	100	7
24	Lapeer, *H. McC.* ......*	4	0	0	0	0	100	2	0	0	0	0	0	0	----	----	0	0	0	0	25	4	0	0	75	4	100	1	100	2
25	Lexington, A. M. O.....	4	0	0	0	0	0	0	0	0	0	0	0	0	50	3	0	0	50	2	0	0	0	0	25	2	0	0	0	0
26	Port Huron, G. A. S....	4	----	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	3	0	0	0	0	0	0	50	1	50	1
27	Port Huron, *E. P. T.*..	3	0	0	0	0	0	0	0	0	0	0	0	0	33	7	0	0	33	5	0	0	0	0	33	6	67	5	67	1
28	Port Huron, A. A. W..	4	0	0	0	0	100	3	0	0	0	0	0	0	100	6	0	0	75	6	0	0	0	0	0	0	100	2	0	0
29	Port Sanilac, J. M. L...	3	----	----	----	----	----	----	----	----	----	----	----	----	33	2	----	----	----	----	----	----	----	----	33	2	33	2	----	----
30	Saginaw City, *E. A. H.*	4	25	11	0	0	75	3	0	0	0	0	0	0	100	10	0	0	25	9	25	10	50	9	0	0	100	5	100	4
31	Saginaw City, N. D. L..	4	0	0	50	4	100	3	0	0	0	0	0	0	100	4	0	0	100	3	25	4	0	0	0	0	100	1	75	4
32	Thornville, J. S. C......	4	0	0	50	7	100	5	0	0	0	0	0	0	50	7	0	0	0	0	50	7	0	0	25	6	100	3	0	0
33	West Bay City, J. W. H.	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	4	0	0	0	0	0	0	100	1	100	2
34	West Bay City, *I. E. R.**	4	0	0	0	0	75	6	0	0	0	0	0	0	100	6	0	0	0	0	0	0	0	0	50	5	100	1	100	4
35	CENTRAL DIVISION.....†	67	47	6	54	6	72	4	25	4	0	0	33	4	100	6	50	8	84	6	64	4	25	9	63	5	90	2	95	4
36	Charlotte, G. B. A......	3	100	11	100	10	100	2	0	0	0	0	0	0	100	13	0	0	100	12	100	7	0	0	0	0	100	2	100	7
37	DeWitt, G. W. T.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	9	----	----	0	0	0	0	25	9	0	0	100	6	100	7
38	Elsie, E. V. C...........	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	0	0	0	0	100	2	100	3
39	Greenville, *A. W. N.*...	2	0	0	0	0	100	8	0	0	0	0	0	0	100	15	100	14	100	13	0	0	0	0	100	7	100	1	0	0

40	Hastings, A. P. D.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	4	0	0	0	0	0	0	0	0	0	0	100	1	0	0
41	Howell, C. V. B.	4	0	0	0	0	100	3	0	0	0	0	25	4	0	0	0	0	0	0	0	0	0	0	0	0	100	1	0	0
42	Hubbardston, H. W. B.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	4	0	0	0	0	0	0	0	0	0	0	50	2	0	0
43	Ionia (H. of C.) W. F. R.	4	25	5	50	5	25	3	0	0	0	0	0	0	100	3	0	0	0	0	25	3	0	0	25	5	100	1	100	4
44	Ionia, *S. F. R.*	4	0	0	0	0	0	0	0	0	0	0	0	0	100	6	0	0	25	7	0	0	0	0	50	5	100	3	100	2
45	Ithaca, I. N. M.	4	25	2	0	0	0	0	25	3	0	0	0	0	100	2	0	0	0	0	75	2	0	0	25	3	75	3	0	0
46	Lansing, *J. H. W.*	4	0	0	0	0	100	7	0	0	0	0	0	0	100	6	0	0	100	3	0	0	0	0	0	0	50	4	0	0
47	Mason, *W. W. R.* *	2	0	0	50	3	100	3	0	0	0	0	50	4	100	5	0	0	0	0	100	3	0	0	100	4	100	2	100	4
48	Muir, L. S. S.	4	0	0	0	0	25	6	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	100	4	100	1	0	0
49	North Lansing, O. M.	4	75	1	25	5	75	3	0	0	0	0	0	0	100	3	50	5	100	4	50	5	0	0	75	5	100	2	0	0
50	Otisville, A. W. N.	4	0	0	0	0	100	1	25	5	0	0	0	0	100	4	25	4	100	2	0	0	0	0	0	0	75	2	100	4
51	Ovid, O. B. C.	4	0	0	0	0	50	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	1
52	Vernon, D. C. H.	4	25	6	0	0	75	4	0	0	0	0	0	0	100	5	0	0	0	0	100	3	0	0	0	0	100	1	100	2
53	Webberville, R. B. S.	4	0	0	0	0	25	3	0	0	0	0	0	0	100	4	0	0	75	3	0	0	0	0	0	0	100	1	50	4
54	SOUTH-WESTERN DIV.†	*29*	*33*	*9*	*63*	*4*	*72*	*3*	*0*	*0*	*50*	*7*	*25*	*5*	*100*	*5*	*0*	*0*	*60*	*4*	*64*	*6*	*0*	*0*	*50*	*8*	*96*	*3*	*89*	*4*
55	Dayton, R. H.	4	0	0	25	5	50	5	0	0	0	0	25	5	100	6	0	0	0	0	25	5	0	0	0	0	100	2	100	4
56	Mattawan, T. H. B.	2	50	5	----	----	50	6	0	0	50	7	0	0	100	5	0	0	50	4	0	0	0	0	100	5	0	0	0	0
57	Niles, S. B.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	2	0	0	0	0	0	0	0	0	100	9	100	4	75	2
58	Niles, J. S. R.	4	25	12	0	0	100	2	----	----	0	0	0	0	100	5	0	0	0	0	75	11	0	0	25	13	100	7	100	9
59	Niles, *I. S.*	4	----	----	----	----	100	2	----	----	----	----	----	----	100	7	----	----	----	----	----	----	----	----	25	9	100	1	100	3
60	Otsego, M. C.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	6	0	0	25	7	0	0	0	0	0	0	100	4	50	5
61	Paw Paw, J. A.	3	0	0	0	0	33	3	0	0	0	0	0	0	100	3	0	0	0	0	100	3	0	0	0	0	67	1	100	2
62	St. Joseph, R. F. S.	4	0	0	100	3	50	3	0	0	0	0	0	0	0	0	0	0	100	2	0	0	0	0	25	3	100	2	100	2
63	SOUTH'N-CENTR'L DIV.†	*76*	*0*	*0*	*25*	*5*	*89*	*3*	*0*	*0*	*0*	*0*	*0*	*0*	*98*	*5*	*67*	*6*	*50*	*8*	*75*	*6*	*25*	*10*	*74*	*6*	*86*	*2*	*79*	*4*
64	Adrian, *A. M. S.*	4	0	0	0	0	100	2	0	0	0	0	0	0	75	3	0	0	50	5	0	0	0	0	0	0	100	1	0	0
65	Albion, A. C.	4	0	0	25	3	100	3	0	0	0	0	0	0	100	2	0	0	0	0	25	3	0	0	75	3	100	3	75	3
66	Ann Arbor, *J. K.*	2	----	----	----	----	----	----	----	----	----	----	----	----	100	3	----	----	----	----	----	----	----	----	----	----	100	1	----	----
67	Battle Creek, *S. S. F.* *	4	----	----	----	----	100	4	----	----	----	----	----	----	100	8	----	----	25	10	100	9	25	10	100	10	100	1	75	6
68	Brooklyn, E. N. P.	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	1	50	3	0	0
69	Centerville, M. S.	4	0	0	25	3	100	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	5	100	1	100	3
70	Clinton, A. W. A.	4	0	0	25	9	50	7	0	0	0	0	0	0	100	6	0	0	50	5	0	0	0	0	100	8	100	1	50	4
71	Coldwater, *G. F. F.*	4	0	0	0	0	100	5	0	0	0	0	0	0	100	7	0	0	25	8	0	0	0	0	0	0	100	2	0	0
72	Hillsdale, *J. W. F.**	4	0	0	0	0	50	5	0	0	0	0	0	0	100	4	50	5	0	0	75	4	0	0	100	4	100	2	100	4
73	Hudson, A. R. S.	2	0	0	0	0	100	3	0	0	0	0	0	0	100	7	100	7	100	4	0	0	0	0	100	4	100	3	100	6
74	Jackson (Pris.), E. L. K.	1	----	----	----	----	100	1	----	----	----	----	----	----	100	5	----	----	----	----	----	----	----	----	----	----	100	4	----	----
75	Jackson, W. W.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	4	0	0	100	9	0	0	0	0	25	9	25	6	0	0
76	Kalamazoo, W. B. S.	4	0	0	0	0	100	4	0	0	0	0	0	0	100	11	0	0	25	12	0	0	0	0	25	11	100	1	100	5
77	Marshall, H. L. J.	4	0	0	0	0	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	6	0	0
78	Mendon, H. C. C.	4	0	0	0	0	100	1	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	75	4	0	0
79	Mendon, E. S.	4	0	0	0	0	100	2	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	75	1	75	1
80	Sturgis, N. I. P.	4	0	0	0	0	25	2	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	75	2	25	3
81	Three Rivers, C. W. B.	4	0	0	0	0	100	3	0	0	0	0	0	0	100	9	0	0	0	0	100	8	0	0	100	7	100	1	100	4
82	Union City, N. H. C.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	100	2	0	0
83	Ypsilanti, *E. B.**	4	----	----	----	----	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	2	0	0
84	SOUTH-EASTERN DIV.†	*38*	*100*	*9*	*92*	*10*	*92*	*5*	*0*	*0*	*0*	*0*	*38*	*6*	*100*	*5*	*80*	*12*	*100*	*12*	*71*	*6*	*100*	*14*	*81*	*7*	*76*	*3*	*95*	*2*
85	Detroit (E. D.), J. B.	4	----	----	0	0	100	8	0	0	0	0	0	0	100	7	0	0	100	10	0	0	0	0	100	11	25	2	100	2
86	Detroit, *E. L.*	4	0	0	100	12	100	6	0	0	0	0	0	0	100	8	50	11	100	10	100	9	100	9	100	9	100	2	100	1
87	Detroit, W. H. R.	4	100	9	100	15	100	4	0	0	0	0	0	0	100	7	100	20	100	15	100	13	100	19	100	11	100	3	100	1
88	Milford, R. J.	4	----	----	0	0	75	4	0	0	0	0	0	0	100	4	0	0	0	0	0	0	0	0	0	0	100	2	0	0
89	Monroe, *A. J. M.*	2	0	0	0	0	100	6	0	0	0	0	0	0	100	7	100	5	0	0	0	0	0	0	50	5	100	2	0	0
90	Northville, J. M. S.	4	----	----	----	----	100	3	----	----	----	----	----	----	100	2	----	----	----	----	----	----	----	----	----	----	75	3	----	----
91	Tronton, W. C.	4	0	0	0	0	50	6	0	0	0	0	0	0	0	0	0	0	0	0	25	5	0	0	0	0	100	1	100	2
92	Utica, G. G. R.	4	0	0	0	0	100	4	0	0	0	0	50	6	100	6	0	0	0	0	100	5	0	0	25	5	25	6	0	0
93	Washington, A. Y.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	3	0	0	0	0	25	4	0	0	100	5	50	4	75	4
94	Wyandotte, E. P. C.	4	----	----	75	4	100	4	0	0	0	0	25	5	100	4	0	0	0	0	75	2	0	0	75	4	100	2	0	0

*, †, ‡, §, ‖. For explanations and references see footnotes on page 327.

TABLE 3.—*Diseases by Localities in Michigan*, **April**, *1880 (Four Weeks ending May 1.)*—CONTINUED.

LINE NUMBER.¶	Fever, Typhoid (Enteric.)		Fever, Typho-Malarial.		Influenza.		Measles.		Neuralgia.		Pneumonia.		Puerperal Fever.		Rheumatism.		Scarlatina.		Small-pox.		Tonsilitis.		Whooping Cough.	
	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present ‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	61	10.0	51	6.0	81	2.8	65	4.2	84	4.4	73	4.5	41	8.2	83	4.2	66	6.7	75	4.0	69	4.3	76	4.5
2	0	0	0	0	100	3	25	5	100	3	75	3	0	0	75	3	0	0	0	0	38	3	100	4
3	0	0	0	0	0	0	25	1	100	2	25	3	0	0	75	2	0	0	0	0	50	2	0	0
4	0	0	0	0	100	1	25	6	100	4	100	3	0	0	100	4	0	0	0	0	25	4	0	0
5	0	0	0	0	100	4	25	7			100	4	0	0	50	4	0	0	0	0			100	4
6	0	0	0	0	100	1	0	0	100	4	88	4	0	0	100	6	0	0	0	0	63	4	63	5
7	0	0	0	0	0	0	0	0	100	2	75	2	0	0	0	0	0	0	0	0	50	3	75	1
8	0	0	0	0	100	1	0	0	100	5	100	5	0	0	100	6	0	0	0	0	75	4	50	9
9	0	0	0	0	100	1	0	0	100	4	67	6	0	0	100	3	33	5	0	0	67	5	0	0
10	0	0	0	0	100	1	0	0	100	4	67	6	0	0	100	3	33	5	0	0	67	5	0	0
11	75	15	50	10	90	3	75	4	89	4	92	5	25	11	80	5	100	6	0	0	88	6	100	10
12	0	0	0	0	100	3	75	3	75	4	0	0	0	0	100	5	0	0	0	0	75	7	0	0
13	0	0	0	0	0	0	50	3	100	3	75	3	0	0	50	3	0	0	0	0	100	4	0	0
14	0	0	0	0	50	4	0	0	75	5	100	3	0	0	0	0	100	4	0	0	0	0	0	0
15			50	3					75	4	100	2	25	11	50	3	100	7			50	8		
16	0	0	0	0	100	3	100	5	100	4	75	5	0	0	0	0	0	0	0	0	100	5		
17	0	0	0	0	100	2	0	0	100	5	100	6	0	0	100	7	0	0	0	0	100	9	100	11
18	75	15	50	16	100	5	0	0	100	4	100	10	0	0	100	8	0	0	0	0	100	4	100	6
19	25	7	25	7	0	0	63	2	100	5	75	4	0	0	100	2	0	0	0	0	88	3	0	0
20	25	7	25	7			100	1	100	5	50	6			100	2					100	4		
21	0	0	0	0	0	0	25	2	0	0	100	2	0	0	100	2	0	0	0	0	75	2	0	0
22	25	12	25	3	65	3	44	5	90	4	76	4	0	0	76	4	100	4	0	0	66	4	68	3
23	0	0	0	0	100	3	0	0	100	4	100	6	0	0	100	6	0	0	0	0	100	6	50	8
24	0	0	0	0	0	0	25	5	100	4	100	4	0	0	75	5	0	0	0	0	75	4	0	0
25	0	0	0	0	0	0	0	0	75	2	25	2	0	0	25	2	0	0	0	0	0	0	100	1
26	0	0	25	3	0	0	50	3	0	0	0	0	0	0	0	0	0	0	0	0	25	2	25	3
27	0	0	0	0	0	0			100	4	33	2			100	3	100	4	0	0	33	4	33	5
28	0	0	0	0	0	0	0	0	50	6	25	5	0	0	25	7	100	4	0	0	0	0	100	2
29					33	1					67	2			33	1							33	2
30	25	12	0	0	100	2	25	8	100	5	100	7	0	0	100	6	0	0	0	0	75	8	100	5
31	0	0	0	0	25	4	75	3	100	2	100	4	0	0	100	3	0	0	0	0	50	4	50	3
32	0	0	0	0	100	2	0	0	100	5	100	7	0	0	100	6	0	0	0	0	100	5	100	2
33	0	0	25	3	0	0	0	0	75	3	0	0	0	0	75	2	0	0	0	0	25	2	0	0
34	0	0	0	0	25	5	0	0	100	6	100	4	0	0	100	3	0	0	0	0	100	2	0	0
35	50	3	67	7	62	3	75	3	70	5	67	5	50	8	75	4	78	5	0	0	63	4	74	3
36	0	0	67	12	100	2	0	0	100	8	100	7	0	0	100	5	0	0	0	0	100	4	0	0
37	0	0	0	0	0	0	50	10	100	6	100	7	50	10	100	5	75	8	0	0	100	3	100	1
38	0	0	50	4	0	0	0	0	0	0	25	5	0	0	100	2	0	0	0	0	0	0	0	0

	DISEASES REPORTED WHICH WERE NOT PRINTED ON THE BLANKS, AMOUNT OF SICKNESS, ETC.¶	Per cent of Weeks Present.‡	Av. Order of Prev. when Present.§
4	Pleuritis	100	4
	Croup	25	5
5	Apoplexy	25	7
13	Pharyngitis, cystitis, each	25	5
15	Otitis	25	10
	Otorrhea	25	13
17	Amount and severity of diseases evidently decreasing, April 21. Still less sickness, May 1.		
20	Pleuritis	25	7
23	Little sickness and little change.		
30	Dyspepsia	75	8
31	Very little sickness, May 1.		
37	Spasmodic croup	100	8
	Abscess	50	7
	Mumps, dropsy, waxy liver, each	25	8
40	Pharyngitis	75	3
43	Pleurisy	75	2
45	Parotitis	25	1
47	Many horses suffering with distemper, in vicinity of Dansville, April 9.		
48	A number of cases of mumps, in the schools, April 10.		
49	Bright's disease	50	5
	Indigestion	25	4
50	Most malignant diseases prevalent, in wks. ending April 24 and May 1.		
52	Continues unusually healthy; measles reported in outlying districts, but mild, Apr. 19.		
53	Chicken-pox	25	4
55	See Line-number 55 (for April), page 339.		
56	Chronic inflammation of kidney	50	8
58	Meningitis	50	13
61	Dyspepsia, chorea, menorrhagia, cancer of uterus, gastralgia, congestion of brain, each	33	3
	Paralysis	67	3
64	Pharyngitis	25	5
	Pleurisy	25	4
	Pharyngitis	25	1
	Not much sickness, Apr. 22.		
	The cases reported as tonsilitis perhaps		

39	0	0	0	0	100	5	100	2	100	12	100	4	100	11	100	10	100	9	0	0	100	6	100	3
40	0	0	0	0	100	2	0	0	25	5	50	3	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0	25	2	0	0	0	0	0	0	50	4	0	0	0	0	0	0	0	0	75	2
42	0	0	0	0	0	0	50	3	50	4	25	6	0	0	100	2	0	0	0	0	25	4	0	0
43	0	0	0	0	0	0	0	0	100	4	75	4	0	0	100	2	0	0	0	0	25	5	75	2
44	0	0	0	0	50	5	100	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	5
45	50	3	0	0	0	0	50	3	25	2	0	0	0	0	100	1	0	0	0	0	0	0	50	2
46	0	0	0	0	25	6	100	1	75	6	25	4	25	7	50	7	100	2	0	0	50	3	25	5
47	0	0	100	5	0	0	100	3	100	4	100	4	0	0	50	3	0	0	0	0	100	3	0	0
48	0	0	0	0	100	2	0	0	75	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	100	2	75	5	75	4	0	0	25	4	75	3	0	0	75	4	0	0
50	0	0	0	0	0	0	0	0	25	5	0	0	0	0	50	5	0	0	0	0	25	2	0	0
51	0	0	0	0	25	3	0	0	0	0	0	0	0	0	50	2	0	0	0	0	0	0	75	3
52	0	0	0	0	0	0	75	5	100	4	100	4	0	0	100	4	0	0	0	0	0	0	75	4
53	0	0	0	0	0	0	50	4	0	0	75	3	0	0	25	5	50	3	0	0	75	2	0	0
54	*0*	*0*	*100*	*5*	*72*	*2*	*63*	*7*	*88*	*5*	*80*	*5*	*0*	*0*	*100*	*5*	*44*	*8*	*0*	*0*	*72*	*4*	*85*	*5*
55	0	0	0	0	25	2	50	4	100	4	50	5	0	0	0	0	0	0	0	0	50	4	100	1
56	0	0	0	0	100	1	0	0	100	2	50	3	0	0	100	4	0	0	0	0	100	4	0	0
57	0	0	100	5	75	5	100	8	100	9	75	10	0	0	100	5	75	12	0	0	75	7	100	8
58	0	0	0	0	100	1	75	12	100	7	100	5	0	0	100	6	25	10	0	0	100	4	100	11
59	----	----	----	----	----	----	----	----	100	6	----	----	----	----	100	6	50	8	----	----	----	----	100	4
60	0	0	0	0	100	2	25	5	75	4	100	6	0	0	100	4	0	0	0	0	0	0	25	1
61	0	0	0	0	100	2	0	0	33	3	100	1	0	0	100	2	0	0	0	0	0	0	0	0
62	0	0	0	0	25	2	0	0	0	0	75	2	0	0	0	0	25	3	0	0	50	2	0	0
63	*50*	*10*	*0*	*0*	*92*	*3*	*74*	*3*	*85*	*4*	*58*	*4*	*25*	*6*	*87*	*4*	*64*	*7*	*75*	*4*	*63*	*4*	*70*	*4*
64	0	0	0	0	0	0	0	0	25	4	50	5	0	0	100	2	50	5	0	0	0	0	0	0
65	0	0	0	0	100	2	50	2	100	3	25	3	0	0	100	2	0	0	0	0	75	2	100	2
66	----	----	----	----	----	----	----	----	----	----	50	3	----	----	----	----	----	----	----	----	----	----	----	----
67	50	10	----	----	100	6	50	10	100	7	100	2	----	----	100	6	----	----	----	----	100	4	50	9
68	0	0	0	0	0	0	25	3	0	0	75	3	0	0	75	2	0	0	0	0	50	1	0	0
69	0	0	0	0	100	3	0	0	100	3	50	5	0	0	100	3	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	100	3	100	4	0	0	100	5	25	7	0	0	0	0	0	0
71	0	0	0	0	0	0	100	5	100	2	50	7	0	0	100	4	25	8	0	0	100	5	0	0
72	0	0	0	0	100	3	75	1	100	3	75	4	0	0	100	3	0	0	0	0	0	0	25	2
73	0	0	0	0	100	2	100	1	100	3	100	5	0	0	100	6	100	6	0	0	100	2	0	0
74	----	----	----	----	----	----	100	2	100	5	100	7	----	----	100	4	----	----	----	----	100	4	----	----
75	0	0	0	0	100	1	100	6	75	6	100	3	0	0	100	5	100	7	0	0	100	6	----	----
76	0	0	0	0	100	3	100	7	0	0	75	6	0	0	75	8	100	9	0	0	50	8	100	3
77	0	0	0	0	100	1	0	0	100	4	25	4	0	0	25	4	0	0	0	0	75	4	0	0
78	0	0	0	0	25	3	0	0	100	2	50	4	0	0	50	5	0	0	0	0	25	3	0	0
79	0	0	0	0	0	0	50	4	50	4	25	4	0	0	75	3	0	0	0	0	25	4	0	0
80	0	0	0	0	0	0	100	1	0	0	25	3	0	0	25	2	0	0	0	0	25	4	0	0
81	0	0	0	0	100	4	0	0	100	4	50	9	25	6	75	5	0	0	0	0	50	8	0	0
82	0	0	0	0	0	0	25	1	100	3	25	5	0	0	100	5	0	0	0	0	25	2	0	0
83	0	0	0	0	0	0	100	1	25	2	25	3	0	0	50	4	0	0	75	4	0	0	75	4
84	*100*	*12*	*50*	*5*	*92*	*3*	*63*	*6*	*79*	*5*	*90*	*5*	*0*	*0*	*100*	*5*	*58*	*8*	*0*	*0*	*81*	*6*	*81*	*7*
85	0	0	0	0	100	2	0	0	100	5	100	3	0	0	100	9	25	10	0	0	75	6	----	----
86	100	10	100	8	100	3	100	10	100	5	100	8	0	0	100	4	100	9	0	0	100	8	100	9
87	100	13	0	0	100	5	100	17	100	10	100	7	0	0	100	8	100	18	0	0	100	3	100	15
88	0	0	0	0	0	0	25	1	25	4	0	0	0	0	0	0	50	3	0	0	0	0	100	2
89	0	0	0	0	50	1	0	0	100	5	100	4	0	0	100	6	0	0	0	0	100	9	0	0
90	----	----	----	----	100	1	----	----	25	4	----	----	----	----	----	----	----	----	----	----	----	----	25	3
91	0	0	0	0	0	0	0	0	100	5	75	4	0	0	100	4	0	0	0	0	0	0	0	0
92	0	0	0	0	100	2	100	2	75	4	75	5	0	0	100	4	25	4	0	0	75	4	0	0
93	0	0	25	4	75	4	25	4	100	3	75	4	0	0	100	1	0	0	0	0	100	5	0	0
94	0	0	25	2	0	0	25	3	0	0	100	3	0	0	100	3	50	5	0	0	25	4	0	0

65 should have been reported as pharyngitis, as inflammation of the tonsils only constituted a share of the general inflammation of the throat, which generally is quite severe.—AMOS CROSBY, *Albion, Apr. 12, '80.* The cases referred to as pharyngitis were not. I think, cases of what Oertel calls "catarrhal diphtheria." They were not contagious. At all events no evidence has come to my knowledge that would warrant such a conclusion. There was not false membrane in any of the cases. They were not mixed up with any genuine cases of diphtheria. The disease is not spreading, and I think has nearly or quite abated.—AMOS CROSBY, *Albion, April 17, 1880.*

68	Mumps	25	2
70	Inflammation of throat (that is, of mucous surface and glands)	25	1

72 A teacher in a ward says she has had 30 cases of measles in her school, but so light as seldom to call a physician.—Apr. 17. Very healthy except measles, which are many but very light.—Apr. 24. Two ward schools are broken up by whooping-cough and measles; *few* cases severe,—May 1.

74	Syphilis	100	4
75	Laryngitis, S.	100	3
79	Hematuria	50	4
	Pelvic peritonitis	25	5
81	Colic	25	10
	Continues healthy, 4 weeks ending May 1.		
83	See line-number 83 for April, p. 351.		
85	Catarrhal pneumonia	100	4
87	About average amount of sickness, Apr. 10. Rather healthy, Apr. 24.		
90	Health improving, April 10. Increase of influenza and bronchial irritation, Apr. 17. Not much sickness, May 1.		
	Inflammatory sore throat	50	1
93	Dyspepsia	100	1

"Have just passed through an epidemic of measles; no deaths within village limits."—CLARK DE MUTH, M. D., *Plymouth, Apr. 23, '80.*

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‡, § For these references, see page 327.

¶ The several numbered lines on pages 342-3, continue statements for the localities and divisions which are named and have the same line-numbers on pages 340-1. On the right side of the page the numbers before the side-notes are the line numbers of the localities, on pages 340-1, to which the side-notes refer.

TABLE 3.—CONTINUED.—*Diseases by Localities in Michigan, Four Weeks ending* **May** *29, 1880.*

Line Number.	Divisions and Localities Represented, and Initials of Physicians who Reported.* (Health Officers in Italics; those also Correspondents marked with a*.)	Reports Received.	Brain, Inflamm'n of.		Bowels, Inflamm'n of.		Bronchitis.		Cerebro-Spinal Men'gitis.		Cholera Infantum.		Cholera Morbus.		Consumption, Pulmonary.		Croup, Membranous.		Diphtheria.		Diarrhea.		Dysentery.		Erysipelas.		Fever, Intermittent.		Fever, Remittent.	
			Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	ALL LOCALITIES.........‖	314	43	6.2	43	6.1	89	3.5	36	7.5	38	6.3	42	6.5	87	5.4	65	6.8	60	5.9	71	4.9	55	8.2	58	5.5	97	1.8	80	3.2
2	UPPER-PENIN. DIV.....†	11	0	0	0	0	73	2	0	0	0	0	0	0	100	2	0	0	0	0	64	3	0	0	50	6	0	0	0	0
3	Central Mine, G. W. O.	4	0	0	0	0	25	2	0	0	0	0	0	0	0	0	0	0	0	0	25	2	0	0	25	2	0	0	0	0
4	Houghton, H. W. J......	4	0	0	0	0	100	3	0	0	0	0	0	0	100	1	0	0	0	0	75	4	0	0	75	7	0	0	0	0
5	Marquette, H. S. T......	3	----	----	----	----	100	2	0	0	0	0	0	0	100	3	0	0	0	0	100	4	0	0	0	0	0	0	0	0
6	NORTH-WESTERN DIV..†	8	0	0	0	0	100	4	0	0	50	10	25	9	50	12	25	8	0	0	63	6	50	8	50	6	100	1	0	0
7	Cadillac, *J. M. W.*......	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	0	0	25	3	0	0	0	0
8	Manistee, *G. La. M.*....	4	0	0	0	0	100	4	0	0	50	10	25	9	50	12	25	8	0	0	100	8	50	8	75	8	100	1	0	0
9	WESTERN DIVISION.....†	30	50	5	36	7	92	4	75	16	38	6	50	6	100	7	0	0	50	9	88	8	67	10	63	8	90	2	77	3
10	Cedar Springs, C. S. F..	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	1	25	3
11	Drenthe, H. K..........	4	0	0	25	4	100	1	0	0	50	4	25	4	100	4	0	0	0	0	75	4	0	0	25	4	100	2	50	4
12	Grand Haven, *J. N. R.*..	2	50	4	50	4	0	0	0	0	0	0	0	0	0	0	0	0	100	5	0	0	0	0	0	0	100	2	100	3
13	Grand Haven, A. V......	4	50	5	25	5	75	5	----	----	25	7	25	5	----	----	----	----	50	6	75	6	25	6	25	8	25	2	75	2
14	Grand Rapids, A. H.....	4	0	0	0	0	75	5	0	0	0	0	0	0	100	5	0	0	50	6	0	0	0	0	0	0	100	2	100	1
15	Ludington, *A. P. McC.*	4	----	----	----	----	100	4	0	0	0	0	0	0	100	6	0	0	0	0	0	0	0	0	0	0	100	1	0	0
16	Muskegon, J. P. S......	4	0	0	50	14	100	4	0	0	0	0	0	0	100	9	0	0	50	13	100	9	100	8	100	8	100	2	100	4
17	Muskegon, *O. C. W.*....	4	----	----	----	----	100	7	75	16	0	0	100	9	100	13	----	----	100	13	100	12	75	17	100	13	100	1	100	2
18	NORTH'N-CENTRAL DIV.†	8	0	0	0	0	100	3	25	1	25	4	25	6	25	6	75	4	75	3	50	2	0	0	63	3	88	1	25	4
19	Big Rapids, *I. W. B.*....	4	----	----	0	0	100	3	25	1	25	4	25	6	25	6	75	4	100	4	75	3	0	0	100	5	100	1	25	4
20	Roscommon, W. S. W...	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	2	25	1	0	0	25	1	75	1	0	0
21	BAY AND EASTERN DIV.†	43	0	0	38	6	77	4	0	0	0	0	0	0	72	5	50	6	56	4	50	5	25	4	56	4	95	1	79	4
22	Bay City, W. R. M......	4	----	----	----	----	75	3	0	0	0	0	0	0	100	5	0	0	50	4	75	3	0	0	100	6	100	1	100	7
23	Lapeer, *H. McC.*.......*	4	0	0	0	0	75	3	0	0	0	0	0	0	25	6	0	0	0	0	50	3	0	0	50	4	100	1	100	3
24	Lexington, A. M. O.....	4	0	0	0	0	0	0	0	0	0	0	0	0	50	3	0	0	0	0	0	0	0	0	50	3	0	0	0	0
25	Port Huron, G. A. S....	3	0	0	0	0	67	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	3	100	1	0	0
26	Port Huron, A. A. W...	4	0	0	0	0	100	3	0	0	0	0	0	0	100	5	50	6	6	0	25	5	0	0	0	0	100	2	0	0
27	Port Sanilac, J. M. L...	4	----	----	----	----	----	----	----	----	----	----	----	----	100	3	----	----	----	----	----	----	----	----	----	----	50	2	----	----
28	Saginaw City, *E. A. H.*	4	0	0	0	0	100	5	0	0	0	0	0	0	50	9	0	0	0	0	25	8	0	0	0	0	100	1	100	3
29	Saginaw City, N. D. L.	4	0	0	50	5	100	3	0	0	0	0	0	0	100	4	0	0	75	5	25	3	25	4	25	5	100	1	25	5
30	Thornville, J. S. C.......	4	0	0	25	7	100	4	0	0	0	0	0	0	25	7	0	0	0	0	100	5	0	0	0	0	100	2	100	3
31	West Bay City, J. W. H.	4	0	0	0	0	25	3	0	0	0	0	0	0	0	0	0	0	25	1	0	0	0	0	25	4	100	1	25	2
32	West Bay City, *I. E. R.**	4	0	0	0	0	50	6	0	0	0	0	0	0	100	6	0	0	75	4	0	0	0	0	100	4	100	1	100	5
33	CENTRAL DIVISION.....†	73	55	8	47	8	68	3	29	9	0	0	36	8	85	6	100	14	55	6	73	4	50	7	58	6	100	2	88	3
34	Charlotte, G. B. A......	3	100	12	100	13	100	2	33	15	0	0	33	12	100	15	0	0	100	15	100	8	0	0	100	13	100	2	100	7
35	Corunna, *J. B.*..........	2	----	----	0	0	50	3	0	0	0	0	0	0	0	0	0	0	50	3	100	2	100	4	100	4	100	1	100	2
36	DeWitt, G. W. T.........	4	0	0	0	0	100	2	0	0	0	0	0	0	100	9	----	----	0	0	100	9	25	10	0	0	100	5	100	7
37	Elsie, E. V. C............	4	0	0	0	0	0	0	25	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	4	100	2	100	1
38	Greenville, *A. W. N.*...	4	0	0	0	0	100	8	0	0	0	0	0	0	100	15	100	14	100	13	0	0	0	0	100	7	100	1	0	0

39	Hastings, A. P. D.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	2	0	0	50	4	0	0	0	0	0	0	100	1	0	0
40	Hastings, *J. C. L.*	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	2	75	2	0	0	0	0	100	1	75	2
41	Howell, C. V. B.	4	0	0	0	0	25	1	0	0	0	0	0	0	0	0	0	0	25	2	0	0	0	0	0	0	100	1	0	0
42	Hubbardston, H. W. B.	4	0	0	0	0	6	0	0	0	0	0	0	0	100	6	0	0	0	0	0	0	0	0	0	0	100	2	0	0
43	Ionia (H. of C.) W. F. R.	4	50	5	50	5	0	0	0	0	0	0	0	0	100	4	0	0	0	0	25	3	0	0	0	0	100	1	100	4
44	Ionia, *S. V. R.*	4	0	0	0	0	0	0	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	25	6	100	2	100	3
45	Lansing, *J. H. W.*	4	0	0	0	0	100	4	0	0	0	0	25	7	75	5	0	0	25	4	0	0	0	0	0	0	100	2	0	0
46	Mason, *W. W. R.**	4	25	6	25	7	50	6	0	0	0	0	50	6	100	7	0	0	0	0	100	4	0	0	75	6	100	2	100	5
47	Muir, L. S. S.	4	0	0	0	0	0	0	0	0	0	0	0	0	25	5	0	0	0	0	50	5	0	0	50	4	100	1	75	3
48	North Lansing, O. M.	4	0	0	25	5	50	6	0	0	0	0	0	0	100	4	0	0	50	5	25	5	0	0	25	5	100	3	0	0
49	Otisville, A. W. N.	4	0	0	0	0	50	2	0	0	0	0	0	0	100	3	0	0	75	3	0	0	0	0	25	4	100	1	50	3
50	Ovid, O. B. C.	4	0	0	0	0	75	2	0	0	0	0	0	0	25	3	0	0	0	0	0	0	0	0	0	0	0	0	100	1
51	Vernon, D. C. H.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	6	0	0	0	0	100	4	0	0	0	0	100	1	100	2
52	Webberville, R. B. S.	4	0	0	0	0	50	2	0	0	0	0	0	0	50	3	0	0	0	0	75	2	0	0	0	0	100	1	50	3
53	SOUTH-WESTERN DIV.†	31	13	5	33	7	61	4	0	0	0	0	29	6	90	5	0	0	38	5	100	7	0	0	52	5	97	3	100	3
54	Dayton, R. H.	4	50	4	0	0	25	4	0	0	0	0	0	0	100	4	0	0	0	0	0	0	0	0	75	3	100	2	100	3
55	Mattawan, T. H. B.	3	33	5	----	----	33	6	0	0	0	0	33	2	100	4	0	0	0	0	0	0	0	0	33	4	100	3	100	2
56	Niles, S. B.	4	0	0	0	0	25	9	0	0	0	0	25	10	100	3	0	0	0	0	0	0	0	0	100	7	100	3	100	1
57	Niles, J. S. R.	4	0	0	25	12	100	2	0	0	0	0	0	0	100	6	0	0	0	0	100	10	0	0	0	0	100	5	100	8
58	Niles, *I. S.*	4	----	----	----	----	100	1	----	----	----	----	----	----	100	7	----	----	----	----	----	----	----	----	25	5	100	2	100	3
59	Otsego, M. C.	4	0	0	50	7	75	3	0	0	0	0	0	0	100	7	0	0	25	7	0	0	0	0	25	6	100	4	100	5
60	Paw Paw, J. A.	4	0	0	0	0	50	2	0	0	0	0	0	0	100	2	0	0	0	0	100	3	0	0	0	0	75	1	100	2
61	St. Joseph, R. F. S.	4	0	0	25	2	75	2	0	0	0	0	0	0	25	3	0	0	50	2	0	0	0	0	50	2	100	1	100	1
62	SOUTH'N-CENTRAL DIV.†	71	29	7	53	4	95	3	33	4	0	0	63	5	93	5	50	5	63	6	80	4	38	8	56	6	99	2	77	3
63	Adrian, *A. M. S.*	4	0	0	0	0	75	3	0	0	0	0	0	0	100	3	0	0	100	3	0	0	0	0	0	0	100	1	25	3
64	Albion, A. C.	4	0	0	50	3	100	3	0	0	0	0	0	0	100	3	0	0	0	0	100	3	0	0	50	3	100	2	100	3
65	Battle Creek, *S. S. F.**	4	----	----	----	----	100	6	----	----	----	----	----	----	100	7	----	----	----	----	100	8	25	10	100	8	100	1	100	2
66	Brooklyn, E. N. P.	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	100	1	0	0
67	Centerville, M. S.	4	0	0	50	4	100	2	0	0	0	0	75	4	0	0	0	0	0	0	75	4	0	0	0	0	100	2	100	3
68	Clinton, A. W. A.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	5	0	0	0	0	50	3	50	6	50	7	100	1	50	5
69	Hillsdale, *J. W. F.**	4	0	9	50	5	100	5	0	0	0	0	50	5	100	5	50	5	0	0	100	3	0	0	75	4	100	3	100	4
70	Jackson (Pris.) E. L. K.	4	----	----	----	----	100	1	----	----	----	----	----	----	100	4	----	----	----	----	75	7	----	----	25	7	100	3	----	----
71	Jackson, W. W.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	4	0	0	75	7	0	0	0	0	0	0	100	6	0	0
72	Kalamazoo, W. B. S.	4	0	0	0	0	75	5	0	0	0	0	0	0	100	7	0	0	0	0	0	0	0	0	0	0	100	1	100	3
73	Marshall, H. L. J.	4	0	0	0	0	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	2	0	0
74	Marshall, *J. F. S.*	3	33	4	67	3	100	2	33	4	0	0	0	0	33	2	0	0	0	0	100	3	0	0	0	0	100	1	67	3
75	Mendon, H. C. C.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	4	0	0	25	6	0	0	0	0	25	6	100	2	0	0
76	Mendon, E. S.	4	----	----	0	0	75	2	0	0	0	0	0	0	50	2	0	0	0	0	25	3	0	0	0	0	100	1	75	3
77	Sturgis, N. I. P.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	100	2	25	3
78	Three Rivers, C. W. B.	4	25	9	0	0	100	3	0	0	0	0	0	0	100	9	0	0	0	0	100	5	0	0	100	9	100	1	100	2
79	Union City, N. H. C.	4	0	0	0	0	100	3	0	0	0	0	0	0	100	7	0	0	50	7	0	0	0	0	0	0	100	2	0	0
80	Ypsilanti, *E. B.**	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	2	0	0
81	SOUTH-EASTERN DIV.—†	39	55	7	43	6	81	4	25	6	0	0	50	6	97	5	100	4	84	7	68	6	100	9	70	6	100	2	67	3
82	Detroit (E. D.) J. B.	4	0	0	0	0	100	3	0	0	0	0	0	0	75	7	0	0	100	5	25	6	0	0	25	4	100	1	25	4
83	Detroit, *E. L.*	4	0	0	0	0	100	8	0	0	0	0	0	0	100	8	0	0	100	9	100	9	100	9	100	9	100	2	100	1
84	Detroit, W. H. R.	4	100	12	100	11	100	4	0	0	0	0	0	0	100	7	0	0	75	17	100	10	0	0	100	11	100	2	100	1
85	Milford, R. J.	4	----	----	25	4	0	0	25	6	0	0	0	0	100	4	0	0	0	0	0	0	0	0	0	0	100	3	0	0
86	Monroe, *A. I. S.*	3	33	1	33	1	100	3	0	0	0	0	0	0	100	4	100	4	100	2	67	6	0	0	100	5	100	2	100	2
87	Northville, J. M. S.	4	----	----	----	----	50	3	----	----	----	----	----	----	100	3	----	----	----	----	----	----	----	----	----	----	100	1	75	2
88	Trenton, W. C.	4	0	0	25	4	0	0	0	0	0	0	0	0	0	0	0	0	50	4	25	3	0	0	0	0	100	1	100	2
89	Utica, G. G. R.	4	0	0	25	6	25	6	0	0	0	0	50	6	100	7	0	0	0	0	75	6	0	0	100	6	100	3	75	4
90	Washington, A. Y.	4	25	7	50	6	100	3	0	0	0	0	0	0	100	4	0	0	0	0	50	6	0	0	50	5	100	6	50	5
91	Wyandotte, E. P. C.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	3	0	0	0	0	100	2	0	0	25	4	100	2	50	3

*, †, ‡, §, ‖. For these references, see page 327

TABLE 3.—*Diseases by Localities in Michigan, Four Weeks ending* **May** *29, 1880.*—CONTINUED.

LINE NUMBER.¶	Fever, Typhoid (Enteric.) Per cent of Weeks Present.‡	Fever, Typhoid (Enteric.) Av. Order of Prevalence when Present.§	Fever, Typho-Malarial. Per cent of Weeks Present.‡	Fever, Typho-Malarial. Av. Order of Prevalence when Present.§	Influenza. Per cent of Weeks Present.‡	Influenza. Av. Order of Prevalence when Present.§	Measles. Per cent of Weeks Present.‡	Measles. Av. Order of Prevalence when Present.§	Neuralgia. Per cent of Weeks Present.‡	Neuralgia. Av. Order of Prevalence when Present.§	Pneumonia. Per cent of Weeks Present.‡	Pneumonia. Av. Order of Prevalence when Present.§	Puerperal Fever. Per cent of Weeks Present.‡	Puerperal Fever. Av. Order of Prevalence when Present.§	Rheumatism. Per cent of Weeks Present.‡	Rheumatism. Av. Order of Prevalence when Present.§	Scarlatina. Per cent of Weeks Present.‡	Scarlatina. Av. Order of Prevalence when Present.§	Small-pox. Per cent of Weeks Present.‡	Small-pox. Av. Order of Prevalence when Present.§	Tonsillitis. Per cent of Weeks Present.‡	Tonsillitis. Av. Order of Prevalence when Present.§	Whooping Cough. Per cent of Weeks Present.‡	Whooping Cough. Av. Order of Prevalence when Present.§
1	83	9.0	48	7.3	74	3.6	79	3.8	82	4.0	65	5.3	78	9.8	84	3.9	79	4.9	100	4.0	68	4.5	72	4.7
2	*0*	*0*	*0*	*0*	*82*	*2*	*86*	*4*	*64*	*5*	*86*	*7*	*0*	*0*	*91*	*4*	*75*	*7*	*0*	*0*	*43*	*3*	*55*	*3*
3	0	0	0	0	50	2	100	2	100	2	0	0	0	0	75	2	0	0	0	0	50	2	25	1
4	0	0	0	0	100	2	0	0	50	5	100	5	0	0	100	5	75	7	0	0	0	0	50	4
5	0	0	0	0	100	2	67	6	33	7	67	8	0	0	100	4	0	0	0	0	33	3	100	3
6	*0*	*0*	*0*	*0*	*100*	*2*	*0*	*0*	*88*	*3*	*100*	*5*	*0*	*0*	*63*	*4*	*0*	*0*	*0*	*0*	*75*	*8*	*63*	*7*
7	0	0	0	0	0	0	0	0	75	2	0	0	0	0	25	3	0	0	0	0	0	0	100	1
8	0	0	0	0	100	2	0	0	100	4	100	5	0	0	100	5	0	0	0	0	75	8	25	12
9	*100*	*10*	*25*	*13*	*85*	*5*	*100*	*2*	*96*	*4*	*69*	*5*	*50*	*7*	*90*	*5*	*100*	*3*	*0*	*0*	*82*	*6*	*100*	*13*
10	0	0	0	0	100	5	100	2	0	0	0	0	0	0	100	4	0	0	0	0	100	4	0	0
11	0	0	0	0	0	0	0	0	100	3	25	5	0	0	50	3	0	0	0	0	25	5	0	0
12	0	0	0	0	0	0	0	0	0	0	50	2	0	0	0	0	100	2	0	0	50	6	0	0
13	----	----	25	11	25	10	----	----	75	3	75	4	----	----	----	----	100	3	----	----	100	8	----	----
14	0	0	0	0	100	3	0	0	100	4	50	5	50	7	0	0	0	0	0	0	0	10	0	0
15	0	0	0	0	0	0	0	0	100	4	75	4	----	----	100	2	0	0	0	0	0	0	0	0
16	0	0	0	0	100	2	0	0	100	6	100	5	0	0	100	7	0	0	0	0	100	11	100	12
17	100	10	25	15	100	6	----	----	100	4	100	7	----	----	100	10	----	----	----	----	100	3	100	13
18	*0*	*0*	*0*	*0*	*0*	*0*	*100*	*2*	*75*	*4*	*25*	*6*	*0*	*0*	*75*	*2*	*0*	*0*	*0*	*0*	*75*	*2*	*0*	*0*
19	0	0	0	0	0	0	100	2	75	4	25	6	0	0	75	3	0	0	0	0	100	3	----	----
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	1	0	0	0	0	50	1	0	0
21	*0*	*0*	*25*	*6*	*69*	*3*	*52*	*3*	*91*	*4*	*78*	*5*	*0*	*0*	*83*	*4*	*67*	*3*	*0*	*0*	*70*	*5*	*65*	*3*
22	0	0	0	0	100	5	0	0	100	3	25	5	0	0	100	6	0	0	0	0	50	6	0	0
23	0	0	0	0	0	0	25	4	100	4	25	3	0	0	75	3	0	0	0	0	25	5	25	5
24	0	0	0	0	0	0	0	0	100	3	100	2	0	0	25	3	0	0	0	0	0	0	100	1
25	0	0	0	0	0	0	33	2	0	0	0	0	0	0	0	0	0	0	0	0	33	2	33	2
26	0	0	0	0	0	0	0	0	25	7	100	6	0	0	75	5	50	4	0	0	0	0	100	1
27	----	----	----	----	25	1	----	----	----	----	75	2	----	----	75	1	----	----	----	----	----	----	75	3
28	0	0	25	9	75	5	25	5	100	4	100	7	0	0	100	4	0	0	0	0	75	8	75	9
29	0	0	0	0	0	0	50	5	100	2	100	5	0	0	100	4	0	0	0	0	100	4	25	4
30	0	0	0	0	75	1	0	0	100	5	100	6	0	0	100	6	0	0	0	0	100	6	75	2
31	0	0	25	3	0	0	75	1	0	0	0	0	0	0	0	0	50	2	0	0	0	0	0	0
32	0	0	0	0	0	0	100	2	100	6	75	6	0	0	100	4	100	4	0	0	100	3	0	0
33	*75*	*5*	*50*	*6*	*67*	*4*	*84*	*3*	*78*	*4*	*51*	*6*	*91*	*12*	*75*	*4*	*85*	*4*	*0*	*0*	*59*	*5*	*59*	*3*
34	0	0	0	0	100	3	100	8	100	5	100	10	100	15	100	4	0	0	0	0	100	6	0	0
35	0	0	50	5	0	0	0	0	0	0	0	0	0	0	100	2	0	0	0	0	0	0	100	2
36	0	0	0	0	0	0	100	7	100	7	75	9	75	10	100	6	100	4	0	0	100	4	100	1
37	0	0	0	0	0	0	0	0	50	3	25	5	0	0	50	3	0	0	0	0	25	6	0	0
38	0	0	0	0	100	5	100	2	100	12	100	7	100	11	100	10	100	9	0	0	100	6	100	3

	DISEASES REPORTED WHICH WERE NOT PRINTED ON THE BLANKS, AMOUNT OF SICKNESS, ETC.¶	Per cent of Weeks Present.‡	Av. Order of Prev. when Present.§
11	Dyspepsia	25	3
13	Chicken-pox	50	8
14	Chicken-pox	50	4
16	Not a great amount of sickness.		
22	Too little sickness to be of interest; scarcely a change from week to week.		
28	Chicken-pox	25	0
	Dyspepsia	25	5
30	Mumps	50	5
31	Pharyngitis	25	2
36	Spasmodic croup	50	9
	Scrofula, anemia, each	75	8
	Gonorrhea	25	8
	Mumps	25	6
39	Pharyngitis	25	2
40	Metritis	50	2
43	Pleurisy	25	5
46	Puerperal convulsions	25	6
	Mumps	25	4
47	Cancerous affections (quite a number)	50	5
48	Pleurisy	25	5
	Ten days ago scarlet fever in a severe form broke out in the Gladden school, township of De Witt. Ten cases up to this time, with one death. Eight of the ten cases are my patients; six of them were taken sick in school the same day (April 29th). They all ate new onions. This is the same territory where diphtheria has prevailed.—*N. Lansing, May 9, 1880.*—O. MARSHALL.		
51	Very little sickness of any kind, May 29.		
55	Cellulitis	33	7
	Acute mortification	33	5
	Acute mania	33	5
60	Paralysis, dyspepsia, each	75	2
	Bilious cholic, gonorrhea, dropsy, syphilis, peritonitis, lumbago, each	25	3
63	Asthma	25	4
	Pharyngitis	25	3

39	0	0	0	0	0	0	0	0	25	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	25	3	0	0	50	2	0	0	25	2	0	0	0	0	25	3	25	2
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	100	1	100	4	25	6	0	0	100	3	0	0	0	0	75	5	25	5
43	0	0	50	5	0	0	0	0	100	3	25	5	0	0	100	2	0	0	0	0	25	3	0	0
44	0	0	0	0	0	0	100	2	0	0	25	4	0	0	50	6	0	0	0	0	0	0	25	5
45	0	0	50	6	0	0	100	1	0	0	0	0	0	0	0	0	100	3	0	0	0	0	0	0
46	0	0	50	7	0	0	100	1	100	5	100	6	0	0	100	5	0	0	0	0	75	5	100	3
47	0	0	0	0	50	4	0	0	100	3	0	0	0	0	50	2	0	0	0	0	0	0	0	0
48	75	5	0	0	0	0	100	1	25	5	50	6	0	0	75	5	100	2	0	0	25	6	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	5	0	0	0	0	0	0	50	5
50	0	0	0	0	0	0	0	0	50	2	0	0	0	0	0	0	0	0	0	0	0	0	25	3
51	0	0	0	0	0	0	75	5	100	4	25	6	0	0	100	3	0	0	0	0	0	0	0	0
52	0	0	0	0	25	3	25	1	75	3	25	3	0	0	0	0	25	3	0	0	50	2	0	0
53	*0*	*0*	*100*	*6*	*79*	*3*	*63*	*5*	*93*	*4*	*56*	*6*	*0*	*0*	*93*	*4*	*0*	*0*	*0*	*0*	*67*	*4*	*100*	*5*
54	0	0	0	0	0	0	25	2	100	2	0	0	0	0	0	0	0	0	0	0	75	3	100	1
55	0	0	0	0	100	2	0	0	100	2	0	0	0	0	100	3	0	0	0	0	67	5	----	----
56	0	0	100	6	100	7	100	8	100	7	25	9	0	0	100	5	0	0	0	0	0	0	100	10
57	0	0	0	0	100	4	0	0	100	6	100	5	0	0	100	7	0	0	0	0	100	5	100	11
58	----	----	----	----	----	----	----	----	100	6	25	8	----	----	100	6	----	----	----	----	----	----	100	4
59	0	0	0	0	75	2	0	0	100	4	0	0	0	0	75	5	0	0	0	0	0	0	100	1
60	0	0	0	0	25	2	0	0	50	2	75	3	0	0	75	2	0	0	0	0	25	3	0	0
61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	2	0	0	0	0	0	0	0	0
62	*25*	*10*	*0*	*0*	*66*	*4*	*79*	*4*	*78*	*4*	*63*	*5*	*0*	*0*	*82*	*3*	*100*	*6*	*100*	*4*	*60*	*4*	*78*	*4*
63	0	0	0	0	0	0	0	0	0	0	50	4	0	0	50	2	0	0	0	0	50	4	0	0
64	0	0	0	0	75	3	100	3	100	3	0	0	0	0	100	2	0	0	0	0	25	4	75	2
65	25	10	----	----	50	10	50	10	100	8	100	4	----	----	100	6	----	----	----	----	100	5	50	10
66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	2	0	0	0	0	50	3	0	0
67	0	0	0	0	50	4	0	0	100	4	0	0	0	0	100	3	0	0	0	0	50	4	0	0
68	0	0	0	0	0	0	0	0	100	2	25	4	0	0	100	4	0	0	0	0	0	0	0	0
69	0	0	0	0	75	3	100	1	100	3	75	4	0	0	100	3	0	0	0	0	25	4	100	2
70	----	----	----	----	----	----	----	----	75	6	100	7	----	----	100	2	----	----	----	----	100	5	----	----
71	0	0	0	0	75	1	100	3	0	0	100	4	0	0	100	5	0	0	0	0	100	6	----	----
72	0	0	0	0	75	4	75	6	0	0	0	0	0	0	0	0	100	6	0	0	0	0	100	2
73	0	0	0	0	25	1	50	5	25	2	25	5	0	0	75	4	0	0	0	0	0	0	100	4
74	0	0	0	0	0	0	67	3	67	2	33	2	0	0	100	2	0	0	0	0	100	2	67	2
75	0	0	0	0	0	0	0	0	75	3	25	5	0	0	25	4	0	0	0	0	50	4	0	0
76	0	0	0	0	0	0	0	0	50	2	0	0	0	0	50	2	0	0	0	0	50	3	0	0
77	0	0	0	0	0	0	100	1	0	0	0	0	0	0	50	3	0	0	0	0	25	3	0	0
78	0	0	0	0	100	5	50	8	100	6	75	10	0	0	100	7	0	0	0	0	25	10	50	8
79	0	0	0	0	0	0	0	0	100	5	75	5	0	0	100	5	0	0	0	0	100	2	0	0
80	0	0	0	0	0	0	100	1	25	3	0	0	0	0	50	3	0	0	100	4	0	0	0	0
81	*100*	*10*	*63*	*7*	*70*	*4*	*89*	*5*	*74*	*4*	*74*	*6*	*67*	*6*	*97*	*3*	*74*	*6*	*0*	*0*	*85*	*4*	*75*	*7*
82	100	6	25	4	25	2	50	4	50	3	25	5	0	0	75	4	25	6	0	0	0	0	75	6
83	100	10	100	9	100	5	100	10	100	4	75	10	0	0	100	3	100	10	0	0	100	8	75	6
84	100	13	0	0	100	5	100	16	100	8	100	9	0	0	100	6	100	17	0	0	100	3	100	17
85	0	0	0	0	0	0	100	1	0	0	0	0	----	----	0	0	50	2	0	0	50	5	100	4
86	0	0	0	0	100	1	100	1	100	2	100	3	67	6	100	2	100	4	0	0	100	2	0	0
87	----	----	----	----	50	2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
88	0	0	0	0	0	0	0	0	25	3	0	0	0	0	100	4	0	0	0	0	0	0	0	0
89	0	0	0	0	75	3	100	1	100	3	0	0	0	0	100	4	0	0	0	0	50	5	0	0
90	0	0	0	0	50	7	75	3	100	3	75	5	0	0	100	1	75	3	0	0	100	5	0	0
91	0	0	0	0	0	0	0	0	25	3	75	3	0	0	100	3	75	3	---	---	100	3	25	2

Pneumonia marked pleuro-pneumonia May 22 and 29.

64	Perityphlitis	50	3
68	Eclampsia	25	7
	Croup, false	25	6

69 Dr. C. reports cases of "cynanche ulcerosa" non-contagious, May 8. Measles and whooping-cough mostly light, May 15.

70	Syphilis	100	5
	Laryngitis	50	6

71 The contour of our spring lung troubles has been to this date somewhat peculiar, in that the tendency towards congestions has been very marked; yet we have enjoyed more than an ordinarily mild winter and spring. The scourge phthisis seems, I think, to be increasing his army of victims year by year.—*May, 1880.*—W. WORSFOLD.

This spring has been peculiar in its congestive type of lung difficulties; the least chill or cold seemed to cause at once a congestion. This predisposition continued up to the end of May, and was quite marked for a week or two in quite warm weather in that month.—W. WORSFOLD, *Jackson, July 1, 1880.*

78 Continues healthy, 4 weeks ending May 29.

84 Healthy, 4 weeks ending May 29. Influenza or diphtheria a little more common, May 29.

87 Malarial type, not severe, but general, May 15. Strongly malarial type to almost everything, May 22. "Fever and ague" for keeps, May 29.

89	Dyspepsia	25	2
90	Dyspepsia	100	2

Measles is having a great run in the city, chicken-pox less.—F. D. PARMELEE, *Hillsdale, on May Meteorological Register.*

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‡, §. For these references, see page 327.

¶ The several numbered lines on these two pages continue statements for the localities and divisions which are named and have the same line-numbers on the two preceding pages. On the right side of the page the numbers before the side-notes are the line-numbers of the localities on pages 344-5, to which the side-notes refer.

TABLE 3—CONTINUED.—*Diseases, by Localities in Michigan,* **June**, *1880 (Five Weeks ending July 3).*

LINE NUMBER.	DIVISIONS AND LOCALITIES REPRESENTED, AND INITIALS OF PHYSICIANS WHO REPORTED.* (Health officers in italics; those also Correspondents marked with a.*)	Reports Received.	Brain, Inflam-mat'n of.		Bowels, Inflam-mat'n of.		Bronchitis.		Cerebro-Spinal M'n'gitis.		Cholera Infantum.		Cholera Morbus.		Consumption, Pulmonary.		Croup, Membranous.		Diphtheria.		Diarrhea.		Dysentery.		Erysipelas.		Fever, Intermittent.		Fever, Remittent.	
			Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	ALL LOCALITIES‖	363	51	7.7	51	6.8	74	4.1	27	5.3	40	6.2	42	5.5	95	5.5	47	7.2	56	7.0	71	4.0	47	6.2	51	6.4	95	1.5	77	3.2
2	UPPER PENIN. DIV.†	10	0	0	40	5	60	3	0	0	20	3	0	0	100	2	0	0	0	0	100	3	80	7	30	6	0	0	0	0
3	Central Mine, G. W. O.	5	0	0	40	3	20	3	0	0	20	3	0	0	0	0	0	0	0	0	100	2	0	0	20	4	0	0	0	0
4	Houghton, H. W. J.	5	0	0	40	7	100	3	----	----	0	0	0	0	100	2	0	0	0	0	100	4	80	7	40	7	0	0	0	0
5	NORTH-WESTERN DIV.†	10	20	6	40	5	90	5	0	0	90	5	80	5	60	8	20	9	60	4	100	4	40	7	40	8	100	2	40	5
6	Cadillac, *J. L.*	5	20	6	40	5	100	4	0	0	80	4	60	3	80	5	0	0	60	4	100	2	40	4	40	5	100	2	60	4
7	Manistee, *G. La. M.*	5	0	0	0	0	80	5	0	0	100	6	100	7	40	10	20	9	0	0	100	6	40	10	40	10	100	1	20	5
8	WESTERN DIV.†	35	0	0	100	13	93	5	0	0	60	7	64	6	100	8	0	0	70	10	69	6	70	8	60	8	100	1	87	2
9	Cedar Springs, C. S. F.	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	5	0	0	0	0	100	1	40	2
10	Drenthe, H. K.	5	0	0	0	0	100	3	0	0	60	4	40	5	100	5	0	0	0	0	100	5	0	0	0	0	100	2	80	4
11	Grand Haven, A. V.	5	----	----	----	----	80	5	----	----	80	5	80	6	----	----	----	----	80	9	100	5	80	6	----	----	100	1	100	2
12	Grand Rapids, A. H.	5	0	0	0	0	100	5	0	0	40	6	40	4	100	5	0	0	20	6	40	5	20	7	20	7	100	2	100	1
13	Ludington, *A. P. McC.*	5	----	----	----	----	80	4	0	0	0	0	0	0	100	4	0	0	0	0	20	5	0	0	20	4	100	1	0	0
14	Muskegon, J. P. S.	5	0	0	100	13	100	5	0	0	60	12	60	8	100	9	0	0	80	12	100	8	80	7	100	9	100	1	100	3
15	Muskegon, *O. C. W.*	5	----	----	----	----	100	6	0	0	0	0	100	9	100	15	0	0	100	13	100	11	100	10	100	13	100	1	100	2
16	NORTH'N CENTR'L DIV.†	10	0	0	0	0	100	3	20	7	60	5	40	5	20	5	60	5	50	3	70	3	60	5	100	4	60	2	30	5
17	Big Rapids, *I. W. B.*	5	----	----	----	----	100	3	20	7	60	5	40	5	20	5	60	5	80	5	100	4	60	5	100	4	100	1	40	6
18	Roscommon, W. S. W.	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	1	40	2	0	0	0	0	20	3	20	3
19	BAY AND EASTERN DIV.†	53	22	8	22	5	70	5	0	0	27	6	33	6	100	6	20	11	40	6	58	4	40	5	35	5	87	1	75	3
20	Bay City, W. R. M.	5	----	----	----	----	80	4	0	0	0	0	60	5	100	5	0	0	60	6	100	2	0	0	0	0	100	1	100	4
21	Lapeer, H. Mc C.	5	0	0	0	0	20	4	0	0	0	0	0	0	0	0	0	0	0	0	40	3	0	0	20	3	100	1	100	2
22	Lexington, A. M. O.	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	2	0	0	0	0	20	2	0	0
23	Port Huron, G. A. S.	4	25	4	25	4	25	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	2	75	2
24	Port Huron, A. A. W.	5	----	----	----	----	100	3	----	----	20	6	----	----	100	6	----	----	----	----	20	6	----	----	----	----	100	1	20	6
25	Port Sanilac, J. M. L.	4	----	----	----	----	----	----	----	----	----	----	----	----	100	3	----	----	----	----	----	----	----	----	----	----	25	3	----	----
26	Saginaw City, *E. A. H.*	5	20	12	0	0	60	8	0	0	40	8	20	11	100	9	20	11	40	10	100	4	0	0	0	0	100	1	100	2
27	Saginaw City, N. D. L.	5	0	0	20	6	100	5	0	0	0	0	40	5	100	3	0	0	40	4	80	4	60	5	40	6	100	1	40	6
28	Thornville, J. S. C.	5	0	0	0	0	100	4	0	0	0	0	20	7	100	7	0	0	0	0	100	4	0	0	0	0	100	1	0	0
29	West Bay City, J. W. H.	5	0	0	0	0	40	6	0	0	20	4	40	3	0	0	0	0	40	4	40	4	0	0	20	6	100	1	60	2
30	West Bay City, *I. E. R.**	5	0	0	0	0	100	6	0	0	0	0	20	5	100	6	0	0	20	7	20	5	20	5	60	6	100	2	100	3
31	CENTRAL DIVISION†	81	67	8	82	8	61	4	0	0	24	9	34	6	91	6	0	0	51	7	62	4	43	7	54	7	96	1	69	3
32	Charlotte, G. B. A.	4	100	11	100	13	100	2	0	0	25	16	25	11	100	15	0	0	100	15	100	5	0	0	25	13	100	1	100	9
33	De Witt, G. W. T.	5	0	0	0	0	100	3	0	0	0	0	0	0	100	9	0	0	20	8	100	6	20	9	0	0	100	2	100	4
34	Elsie, E. V. C.	5	0	0	0	0	0	0	0	0	0	0	20	3	0	0	0	0	0	0	80	3	0	0	0	0	100	1	100	2

35	Greenville, *A. W. N.*	5	0	0	100	10	100	9	0	0	0	0	60	9	100	11	0	0	100	10	100	6	80	14	80	11	100	1	80	8
36	Hastings, A. P. D.	5	0	0	0	0	0	0	0	0	0	0	0	0	100	3	0	0	40	3	0	0	0	0	0	0	100	1	0	0
37	Hastings, *J. C. L.*	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	0	0	50	3	100	1	25	3
38	Howell, C. V. B.	5	0	0	0	0	40	3	0	0	0	0	0	0	60	1	0	0	0	0	0	0	0	0	0	0	40	1	20	1
39	Hubbardston, H. W. B.	5	0	0	0	0	0	0	0	0	0	0	0	0	60	6	0	0	0	0	20	2	0	0	0	0	100	3	0	0
40	Ionia, *S. V. R.*	5	0	0	0	0	20	5	0	0	0	0	20	3	100	4	0	0	20	5	0	0	0	0	0	0	100	1	100	2
41	Lansing, *J. H. W.*	5	0	0	0	0	100	5	0	0	20	6	60	6	100	4	0	0	0	0	40	3	0	0	20	7	100	1	80	2
42	Mason, *W. W. R.* *	3	67	7	67	6	33	6	0	0	33	6	100	5	67	7	0	0	33	7	100	3	33	6	0	0	100	2	67	5
43	Muir, L. S. S.	5	0	0	0	0	0	0	0	0	0	0	20	5	0	0	0	0	0	0	40	5	40	5	0	0	100	1	80	4
44	North Lansing, O. M.	5	40	5	60	4	80	3	0	0	0	0	20	4	100	3	0	0	40	4	20	3	0	0	40	5	100	2	40	4
45	Otisville, A. W. N.	5	0	0	0	0	60	2	0	0	0	0	20	5	100	4	0	0	60	2	0	0	0	0	100	3	100	1	20	3
46	Ovid, O. B. C.	5	0	0	0	0	40	3	0	0	0	0	0	0	0	0	0	0	0	0	40	4	20	2	0	0	0	0	100	1
47	Vernon, D. C. H.	5	0	0	0	0	20	5	0	0	20	6	20	5	100	6	0	0	0	0	80	5	0	0	0	0	100	1	100	2
48	Webberville, R. B. S.	5	0	0	0	0	40	3	0	0	0	0	0	0	0	0	0	0	0	0	80	2	60	3	0	0	100	1	26	1
49	SOUTH-WESTERN DIV. †	*34*	*40*	*6*	*30*	*9*	*72*	*5*	*0*	*0*	*40*	*8*	*50*	*6*	*100*	*5*	*40*	*7*	*40*	*11*	*79*	*4*	*40*	*5*	*50*	*7*	*91*	*1*	*85*	*3*
50	Dayton, R. H.	4	----	----	----	----	25	5	0	0	0	0	25	6	100	5	0	0	0	0	50	4	0	0	75	5	100	2	100	3
51	Mattawan, T. H. B.	5	40	6	40	6	80	6	0	0	80	5	60	4	100	5	0	0	0	0	80	2	80	3	20	7	40	1	80	4
52	Niles, S. B.	5	0	0	0	0	0	0	0	0	20	10	60	6	100	5	0	0	40	11	60	6	0	0	100	7	100	1	100	2
53	Niles, J. S. R.	5	0	0	20	11	100	7	0	0	20	10	80	8	100	7	0	0	0	0	100	5	20	10	40	11	100	1	100	5
54	Niles, *I. S.*	5	----	----	----	----	100	4	----	----	----	----	20	8	100	7	----	----	----	----	----	----	----	----	----	----	100	1	100	2
55	Otsego, M. C.	5	0	0	0	0	40	3	0	0	0	0	0	0	100	5	40	7	0	0	0	0	0	0	20	3	100	3	20	3
56	Paw Paw, J. A.	5	0	0	0	0	80	3	0	0	0	0	0	0	100	3	0	0	0	0	100	3	20	3	0	0	100	1	100	2
57	SOUTH'N-CENTRAL DIV. †	*85*	*0*	*0*	*35*	*4*	*74*	*3*	*20*	*4*	*30*	*5*	*25*	*4*	*98*	*5*	*40*	*5*	*40*	*5*	*76*	*3*	*40*	*4*	*51*	*5*	*99*	*2*	*96*	*3*
58	Adrian, *A. M. S.*	5	0	0	0	0	100	2	0	0	0	0	40	3	80	4	0	0	0	0	0	0	0	0	0	0	100	1	0	0
59	Albion, A. C.	5	0	0	0	0	100	4	0	0	20	3	20	3	100	3	0	0	0	0	100	2	0	0	100	4	100	2	100	1
60	Battle Creek, *S. S. F.* *	5	----	----	----	----	60	8	----	----	----	----	20	6	100	8	----	----	----	----	100	2	40	3	40	6	100	1	100	3
61	Brooklyn, E. N. P.	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	100	1	0	0
62	Centreville, M. S.	5	0	0	60	4	40	2	0	0	0	0	20	5	0	0	0	0	0	0	80	4	0	0	40	5	100	1	80	3
63	Clinton, A. W. A.	5	0	0	40	4	0	0	0	0	0	0	0	0	100	3	0	0	0	0	40	2	0	0	0	0	100	1	0	0
64	Hillsdale, *J. W. F.* *	5	0	0	0	0	20	5	0	0	20	5	20	3	100	4	0	0	0	0	100	2	60	4	100	3	100	2	100	3
65	Jackson (Pris.), E. L. K.	5	----	----	----	----	100	1	----	----	----	----	----	----	100	4	----	----	----	----	----	----	----	----	20	6	100	2	----	----
66	Jackson, W. W.	5	0	0	0	0	40	3	0	0	0	0	20	7	100	2	0	0	0	0	0	0	0	0	0	0	100	4	100	6
67	Kalamazoo, W. B. S.	5	0	0	0	0	0	0	0	0	0	0	0	0	100	6	0	0	0	0	100	4	0	0	0	0	100	1	100	3
68	Marshall, H. L. J.	5	0	0	0	0	80	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	3	0	0
69	Marshall, *J. F. S.*	5	0	0	20	4	100	2	20	4	40	5	40	4	----	----	40	5	----	----	60	4	20	4	----	----	100	2	80	4
70	Mendon, H. C. C.	5	0	0	20	5	80	3	0	0	0	0	0	0	100	4	0	0	0	0	0	0	0	0	0	0	100	1	0	0
71	Mendon, E. S.	5	0	0	0	0	80	2	0	0	0	0	0	0	0	0	0	0	0	0	20	2	0	0	0	0	80	2	100	2
72	Three Rivers, C. W. B.	5	0	0	0	0	100	4	0	0	0	0	20	4	100	10	0	0	0	0	100	4	0	0	40	9	100	1	100	2
73	Union City, N. H. C.	5	0	0	0	0	60	4	0	0	40	6	0	0	100	6	0	0	40	5	60	3	0	0	0	0	100	1	0	0
74	Ypsilanti, *E. B.* *	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	1	0	0
75	SOUTH-EASTERN DIV. †	*45*	*80*	*9*	*60*	*8*	*83*	*4*	*40*	*5*	*30*	*5*	*52*	*5*	*100*	*4*	*100*	*6*	*100*	*9*	*78*	*5*	*35*	*8*	*60*	*7*	*98*	*2*	*80*	*3*
76	Detroit (E. D.) J. B.	5	0	0	40	4	60	4	0	0	20	1	0	0	100	4	0	0	0	0	80	2	20	5	0	0	100	2	80	2
77	Detroit, W. H. R.	5	100	12	100	15	100	6	0	0	40	7	60	10	100	6	0	0	100	12	100	8	20	13	100	15	100	3	100	3
78	Milford, R. J.	5	----	----	0	0	0	0	40	5	0	0	20	5	100	4	0	0	0	0	20	6	0	0	0	0	100	2	0	0
79	Monroe, *A. I. S.*	5	0	0	0	0	100	5	0	0	0	0	0	0	100	4	100	6	100	5	100	4	80	5	100	5	100	1	100	1
80	Northville, J. M. S.	5	0	0	0	0	60	2	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	100	1	80	3
81	Trenton, W. C.	5	0	0	80	5	0	0	0	0	0	0	40	4	0	0	0	0	0	0	60	5	0	0	20	4	100	1	100	2
82	Utica, G. G. R.	5	0	0	60	7	80	5	0	0	20	8	60	5	100	6	0	0	0	0	100	3	20	7	40	6	100	2	100	3
83	Washington, A. Y.	5	60	6	20	7	100	3	----	----	0	0	0	0	100	4	0	0	0	0	60	6	0	0	40	7	80	6	40	6
84	Wyandotte, E. P. C.	5	0	0	0	0	0	0	0	0	40	4	80	3	100	3	0	0	0	0	100	2	0	0	0	0	100	1	40	3

*, †, ‡, §, ‖. For references, see footnotes on page 327.

TABLE 3.—*Diseases by Localities in Michigan*, **June**, *1880 (Five Weeks ending July 3.)*—CONTINUED.

LINE NUMBER.¶	Fever, Typhoid (Enteric.) Per cent of Weeks Present.‡	Fever, Typhoid (Enteric.) Av. Order of Prevalence when Present.§	Fever, Typho-Malarial. Per cent of Weeks Present.‡	Fever, Typho-Malarial. Av. Order of Prevalence when Present.§	Influenza. Per cent of Weeks Present.‡	Influenza. Av. Order of Prevalence when Present.§	Measles. Per cent of Weeks Present.‡	Measles. Av. Order of Prevalence when Present.§	Neuralgia. Per cent of Weeks Present.‡	Neuralgia. Av. Order of Prevalence when Present.§	Pneumonia. Per cent of Weeks Present.‡	Pneumonia. Av. Order of Prevalence when Present.§	Puerperal Fever. Per cent of Weeks Present.‡	Puerperal Fever. Av. Order of Prevalence when Present.§	Rheumatism. Per cent of Weeks Present.‡	Rheumatism. Av. Order of Prevalence when Present.§	Scarlatina. Per cent of Weeks Present.‡	Scarlatina. Av. Order of Prevalence when Present.§	Small-pox. Per cent of Weeks Present.‡	Small-pox. Av. Order of Prevalence when Present.§	Tonsillitis. Per cent of Weeks Present.‡	Tonsillitis. Av. Order of Prevalence when Present.§	Whooping Cough. Per cent of Weeks Present.‡	Whooping Cough. Av. Order of Prevalence when Present.§
1	60	6.8	42	5.7	68	3.9	67	4.6	75	4.2	51	5.8	35	9.4	76	4.4	49	5.8	0	0	61	4.8	80	4.6
2	*0*	*0*	*0*	*0*	*70*	*3*	*20*	*4*	*50*	*4*	*50*	*4*	*0*	*0*	*70*	*5*	*0*	*0*	*0*	*0*	*50*	*6*	*100*	*1*
3	0	0	0	0	40	2	20	2	80	3	20	2	0	0	40	4	0	0	0	0	80	3	100	1
4	0	0	0	0	100	3	20	6	20	5	80	6	0	0	100	5	0	0	0	0	20	8	100	1
5	*0*	*0*	*20*	*6*	*60*	*2*	*0*	*0*	*90*	*5*	*20*	*7*	*20*	*4*	*100*	*4*	*0*	*0*	*0*	*0*	*80*	*7*	*50*	*7*
6	0	0	20	6	40	2	0	0	80	5	0	0	20	4	100	3	0	0	0	0	100	3	60	3
7	0	0	0	0	80	2	0	0	100	4	20	7	0	0	100	4	0	0	0	0	60	10	40	11
8	*100*	*10*	*50*	*13*	*95*	*5*	*44*	*9*	*97*	*5*	*40*	*8*	*40*	*10*	*74*	*6*	*47*	*7*	*0*	*0*	*73*	*6*	*52*	*9*
9	0	0	0	0	80	4	100	2	0	0	0	0	0	0	80	4	0	0	0	0	100	5	0	0
10	0	0	0	0	0	0	0	0	100	3	0	0	20	5	80	3	0	0	0	0	60	4	40	1
11	----	----	----	----	----	----	20	12	80	8	----	----	----	----	40	10	100	5	----	----	80	10	60	11
12	0	0	0	0	100	3	40	5	100	4	20	5	20	7	20	7	0	0	0	0	20	5	20	5
13	0	0	0	0	0	0	0	0	100	4	0	0	0	0	100	3	0	0	0	0	0	0	0	0
14	0	0	20	14	100	3	20	13	100	5	80	8	60	12	100	7	20	10	0	0	80	8	40	13
15	100	10	80	12	100	8	40	15	100	4	20	10	60	16	100	6	20	7	0	0	100	4	100	14
16	*0*	*0*	*20*	*5*	*0*	*0*	*100*	*4*	*80*	*4*	*80*	*6*	*0*	*0*	*60*	*3*	*20*	*5*	*0*	*0*	*80*	*3*	*0*	*0*
17	----	----	20	5	----	----	100	4	80	4	80	6	----	----	60	3	20	5	----	----	80	3	----	----
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	*0*	*0*	*45*	*6*	*47*	*6*	*62*	*3*	*80*	*4*	*51*	*5*	*0*	*0*	*82*	*5*	*0*	*0*	*0*	*0*	*83*	*5*	*90*	*3*
20	0	0	0	0	0	0	40	6	100	3	40	7	0	0	100	6	0	0	0	0	80	7	0	0
21	0	0	0	0	0	0	40	4	80	4	40	5	0	0	60	4	0	0	0	0	20	5	0	0
22	0	0	0	0	0	0	0	0	80	3	60	2	0	0	0	0	0	0	0	0	0	0	100	1
23	0	0	0	0	0	0	25	3	25	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	----	----	20	7	40	4	----	----	----	----	100	5	----	----	80	5	----	----	----	----	----	----	100	2
25	----	----	----	----	----	----	----	----	----	----	75	2	----	----	100	1	----	----	----	----	----	----	50	4
26	----	----	80	10	40	9	0	0	100	4	20	8	0	0	80	7	0	0	0	0	100	7	100	7
27	0	0	0	0	0	0	0	0	100	2	40	6	0	0	100	4	0	0	0	0	100	4	100	3
28	0	0	0	0	0	0	80	3	100	5	40	7	0	0	100	5	0	0	0	0	100	5	80	2
29	0	0	20	3	0	0	80	3	20	5	0	0	0	0	40	4	0	0	0	0	0	0	0	0
30	0	0	60	4	60	4	100	1	100	5	0	0	0	0	80	5	0	0	0	0	100	3	0	0
31	*40*	*3*	*45*	*7*	*58*	*5*	*75*	*4*	*61*	*5*	*50*	*6*	*56*	*17*	*56*	*5*	*57*	*6*	*0*	*0*	*65*	*5*	*94*	*3*
32	0	0	0	0	100	4	100	7	100	7	100	11	75	15	100	6	100	14	0	0	100	5	0	0
33	0	0	0	0	0	0	40	8	100	7	20	9	0	0	100	7	40	8	0	0	100	5	100	2
34	0	0	0	0	0	0	0	0	40	4	20	3	0	0	40	4	0	0	0	0	60	4	----	----
35	0	0	80	15	100	12	100	3	100	10	100	10	40	18	100	14	40	4	0	0	100	8	100	3
36	0	0	0	0	0	0	40	4	20	4	40	5	0	0	0	0	0	0	0	0	0	0	100	2
37	0	0	50	2	0	0	0	0	25	3	0	0	0	0	75	3	0	0	0	0	0	0	75	2
38	0	0	40	2	0	0	0	0	0	0	0	0	0	0	40	3	40	3	0	0	20	3	0	0
39	0	0	0	0	40	4	80	1	40	5	40	7	0	0	40	7	0	0	0	0	0	0	80	2

	DISEASES REPORTED, WHICH WERE NOT PRINTED ON THE BLANKS, AMOUNT OF SICKNESS, ETC.¶	Per ct. of Wks. Present.‡	Av. Order of Prevalence.§
4	Cerebral meningitis	20	8
6	Diphtheria in country, June 6. Cholera morbus caused by foul meat; one died in country from drinking belladonna,—June 13. But little sickness, July 3.		
10	Dyspepsia	40	4
14	Not very much sickness of an acute character, June 12. Diphtheria reappeared in the city; attack not severe, week ending June 19.		
20	Not much sickness or change, 2 weeks ending June 12. Some sickness, June 19. Scarcely a change, June 26. No sickness, July 3.		
23	Roseola (June 5)	25	1
	Of late many cases of scarlatina reported, but they prove to be roseola, June 19.		
24	Roseola	20	7
26	Spasmodic croup	20	11
	Dyspepsia	80	6
	State of health generally very good, June 19 and July 3.		
27	Some intermittents with new comers are quite difficult to break up this spring, June 5. Three deaths from consumption, week ending June 12. Consumption in Saginaw is on the increase, and runs a very rapid course, June 19.		
29	Our section is unusually healthy, June 29.		
33	Mumps	40	7
	Scrofula	40	9
	Gonorrhea	20	8
	Herpes	20	10
36	Pneumonia marked pleuro-pneumonia, weeks ending June 26.		2
37	Puerperal convulsions	25	3
	Whooping-cough is prevalent, though but few call a physician, June 5. Intermittent fever, or ague, is much more prevalent than usual this summer, June 30.		
43	Cancer	100	5
44	Mumps	20	4
50	Apoplexy	50	5
	Pericarditis (chronic)	50	5
51	Bifid spine	20	9
	Acute mania	20	7

40	0	0	0	0	0	0	80	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	20	8	0	0	100	2	20	4	0	0	0	0	20	4	60	4	0	0	0	0	0	0
42	0	0	33	6	0	0	100	2	100	5	67	6	0	0	67	6	100	6	0	0	100	4	100	4
43	0	0	0	0	0	0	0	0	80	2	0	0	0	0	60	3	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	100	2	60	4	60	4	0	0	60	4	80	3	0	0	40	1	100	3
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	4	0	0	0	0	0	0	0	0
46	0	0	0	0	40	3	0	0	60	2	0	0	0	0	20	2	20	3	0	0	0	0	0	0
47	0	0	0	0	0	0	20	5	100	4	0	0	0	0	100	3	0	0	0	0	0	0	0	0
48	40	3	0	0	20	3	0	0	20	2	20	2	0	0	20	2	0	0	0	0	20	3	0	0
49	*0*	*0*	*53*	*4*	*73*	*3*	*80*	*8*	*79*	*4*	*60*	*8*	*20*	*7*	*97*	*5*	*0*	*0*	*0*	*0*	*47*	*5*	*84*	*4*
50	0	0	0	0	0	0	0	0	50	4	0	0	0	0	0	0	0	0	0	0	25	5	100	1
51	0	0	0	0	100	3	0	0	100	2	0	0	0	0	100	5	0	0	0	0	80	6	0	0
52	0	0	80	4	0	0	80	8	100	5	0	0	0	0	100	7	0	0	0	0	20	3	40	9
53	0	0	40	6	100	4	0	0	100	6	60	8	0	0	100	6	0	0	0	0	60	6	0	0
54	----	----	----	----	----	----	----	----	100	5	----	----	20	7	100	5	----	----	----	----	----	----	100	4
55	0	0	0	0	20	2	0	0	20	4	0	0	0	0	80	4	0	0	0	0	0	0	100	1
56	0	0	40	3	0	0	0	0	80	3	0	0	0	0	100	3	0	0	0	0	0	0	0	0
57	*20*	*5*	*60*	*4*	*60*	*3*	*77*	*3*	*75*	*4*	*47*	*5*	*20*	*6*	*81*	*4*	*44*	*5*	*0*	*0*	*40*	*4*	*83*	*4*
58	0	0	0	0	0	0	0	0	60	3	60	4	0	0	60	4	60	4	0	0	40	4	0	0
59	0	0	0	0	0	0	20	4	100	4	0	0	0	0	100	3	0	0	0	0	40	3	60	3
60	----	----	----	----	----	----	----	----	60	6	60	5	----	----	80	5	----	----	----	----	60	7	20	10
61	0	0	0	0	0	0	0	0	0	0	20	3	0	0	100	2	0	0	0	0	20	2	0	0
62	0	0	0	0	0	0	0	0	100	2	0	0	0	0	100	3	0	0	0	0	20	5	0	0
63	0	0	0	0	0	0	0	0	60	4	20	5	20	6	100	3	40	6	6	0	0	0	0	0
64	0	0	0	0	40	4	100	1	100	4	0	0	0	0	100	3	0	0	0	0	0	0	100	2
65	----	----	----	----	----	----	----	----	40	6	20	7	----	----	100	3	----	----	----	----	80	4	----	----
66	0	0	0	0	0	0	100	1	0	0	100	3	0	0	100	4	20	7	0	0	0	0	0	0
67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	4	0	0	0	0	100	2
68	0	0	0	0	0	0	100	3	0	0	0	0	0	0	80	5	0	0	0	0	20	3	100	2
69	20	5	40	3	----	----	100	1	80	4	----	----	----	----	100	4	----	----	----	----	80	4	100	3
70	0	0	0	0	0	0	0	0	100	2	0	0	0	0	20	4	0	0	0	0	20	3	0	0
71	0	0	0	0	40	1	0	0	20	2	0	0	0	0	40	3	0	0	0	0	40	3	0	0
72	0	0	0	0	100	4	100	8	100	6	0	0	0	0	100	7	0	0	0	0	20	11	100	8
73	0	0	80	4	0	0	0	0	100	2	0	0	0	0	80	3	0	0	0	0	40	2	0	0
74	0	0	0	0	0	0	20	3	60	2	0	0	0	0	40	2	40	2	0	0	0	0	0	0
75	*67*	*8*	*25*	*3*	*73*	*3*	*73*	*5*	*73*	*5*	*65*	*6*	*20*	*4*	*80*	*4*	*48*	*6*	*0*	*0*	*67*	*4*	*76*	*6*
76	20	5	20	3	20	3	20	4	20	4	0	0	0	0	20	4	0	0	0	0	40	4	100	3
77	100	14	0	0	100	2	60	17	100	8	100	10	0	0	100	8	80	17	0	0	100	5	100	18
78	0	0	0	0	0	0	100	1	0	0	0	0	0	0	20	5	20	3	0	0	20	3	100	3
79	0	0	0	0	100	4	100	3	100	3	100	5	0	0	100	3	100	5	0	0	100	5	0	0
80	0	0	20	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	0	0	40	4	0	0	0	0	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0
82	0	0	0	0	0	0	80	3	100	5	20	6	0	0	100	4	0	0	0	0	80	4	----	----
83	0	0	0	0	0	0	80	3	100	4	0	0	0	0	100	1	20	5	0	0	0	0	40	5
84	80	4	20	2	0	0	0	0	20	3	40	3	20	4	100	3	20	2	0	0	60	3	40	2

55 Unusual mortality among horses this spring, June 12.

56	Inflammation of kidney	60	3
	Peritonitis	60	3
	Gastralgia, gonorrhea, each	40	3
	Dyspepsia	60	3
	Periostitis, epithelioma, each	20	
	Puerperal convulsions, albuminuria, perityphlitis, each	20	3
58	Pharyngitis	20	4
	Pleurisy, peritonitis, each	20	3
59	Apoplexy	20	4
	Pharyngitis	40	1

59 Malarial fever with sore throat seems to have abated since dry weather set in.—June 19.

64 Little sickness, diseases mild, 4 weeks ending June 26. Increase in number of cases, slightly in severity, July 3.

65 Syphilis 100 5

66 Sickness very light, 3 weeks ending July 3.

72 Continues healthy.

74 General good health, 2 weeks ending July 3.

77 See line-number 77, below.

80 Much less ague, and not so severe, June 5. Intermittent fever on the increase again, and general malarial type on increase, June 19. Healthy, June 26.

82	Dyspepsia	20	3
83	Dyspepsia	100	2
	Cystitis	100	5
	Malaria	20	5
	Spinal meningitis	40	7

NOTE FOR APRIL.

LINE-NUMBER 83, P. 341. Two cases of variola have developed themselves, in a girl who works at one of the paper mills, and her brother who carried her her dinner, and was about the rag-room every day. Both broke out the same day, but its true character was not known by the attendant physician for 5 days. Then the board of health was notified and I went to see them. The neighbors were all in to see them after the eruption was fully developed. It was said by the doctor to be "something that was left in the system after the measles," which they had badly a month ago. The boy had been to school till a day or two before the eruption came out. *Every one* has been thoroughly vacinated and the family isolated.

EDWARD BATWELL, M. D.
Ypsilanti, April 24, 1880. *Health Officer.*

LINE NUMBER 77. Quite healthy, 3 weeks ending June 26. Considerable diarrheal trouble with children; quite a number of deaths; cholera infantum is rather severe, July 3.

‡, §. For references, see foot-notes on page 327.

¶ The several numbered lines on these two pages continue statements for the localities and divisions which are named and have the same line-numbers on the two preceding pages; on the right side of the page the numbers before the side-notes are the line numbers of the localities, on pages 348-9, to which the side-notes refer.

TABLE 3.—CONTINUED.—*Diseases by Localities in Michigan, Four Weeks ending* **July** *31, 1880.*

LINE NUMBER.	DIVISIONS AND LOCALITIES REPRESENTED, AND INITIALS OF PHYSICIANS WHO REPORTED.* (Health officers in italics; those also Correspondents marked with a.*)	Reports Received.	Brain, Inflam-mat'n of.		Bowels, Inflam-mat'n of.		Bronchitis.		Cerebro-Spinal M'n'gitis.		Cholera Infantum.		Cholera Morbus.		Consumption, Pulmonary.		Croup, Membranous.		Diphtheria.		Diarrhea.		Dysentery.		Erysipelas.		Fever, Intermittent.		Fever, Remittent.	
			Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.‡	Per cent of Weeks Present.§	Av. Order of Prevalence when Present.§	Per cent of Weeks Present ‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	ALL LOCALITIES	317	52	10.6	50	6.5	67	5.2	41	8.8	73	4.6	74	4.3	90	6.0	25	5.0	60	6.4	92	2.5	68	4.8	51	7.2	91	1.8	84	3.3
2	UPPER-PENIN. DIV.†	8	0	0	38	5	50	4	0	0	50	2	50	3	100	2	0	0	0	0	100	2	75	3	25	3	25	3	0	0
3	Central Mine, G. W. O.	4	0	0	25	3	0	0	0	0	0	0	25	3	0	0	0	0	0	0	100	2	50	3	25	3	25	3	0	0
4	Houghton, H. W. J.	4	0	0	50	6	50	4	0	0	50	2	75	3	100	2	0	0	0	0	100	2	100	3	0	0	0	0	0	0
5	NORTH-WESTERN DIV.†	8	0	0	25	6	63	7	0	0	100	4	100	3	25	10	0	0	100	4	100	2	75	6	25	7	88	2	100	5
6	Cadillac, *J. L.*	4	0	0	25	6	25	6	0	0	100	4	100	4	----	----	----	----	100	4	100	1	75	3	25	2	75	2	----	----
7	Manistee, *G. La. M.*	4	0	0	0	0	100	8	0	0	100	3	100	2	25	10	0	0	0	0	100	3	75	8	25	11	100	2	100	5
8	WESTERN DIV.†	27	38	14	64	10	74	8	25	19	87	6	70	6	95	9	0	0	73	11	93	3	78	6	80	11	100	2	91	3
9	Cedar Springs, C. S. F.	4	0	0	0	0	0	0	0	0	25	5	25	8	0	0	0	0	0	0	100	4	100	5	100	6	100	2	100	2
10	Drenthe, H. K.	4	0	0	25	6	100	4	0	0	100	4	50	6	75	5	0	0	0	0	75	4	0	0	0	0	100	2	100	4
11	Grand Haven, *A. V.**	4	25	8	0	0	25	10	0	0	100	5	50	4	0	0	0	0	0	0	100	3	75	4	25	8	100	2	50	3
12	Grand Rapids, A. H.	4	0	0	0	0	25	5	0	0	100	5	100	5	100	6	0	0	25	7	100	2	25	7	0	0	100	4	100	2
13	Ludington, *A. P. McC.*	4	----	----	----	----	100	3	0	0	0	0	0	0	100	6	0	0	0	0	75	2	75	4	0	0	100	1	0	0
14	Muskegon, J. P. S.	3	0	0	67	12	100	8	0	0	100	6	100	7	100	10	0	0	100	12	100	6	100	9	100	11	100	1	100	4
15	Muskegon, *O. C. W.*	4	50	20	100	13	100	15	25	19	100	11	100	5	100	17	0	0	100	13	100	2	100	5	100	17	100	2	100	2
16	NORTH'N-CENTRAL DIV.†	8	0	0	0	0	100	5	25	7	50	3	63	3	25	5	0	0	100	4	88	2	75	3	50	6	75	3	75	4
17	Big Rapids, *I. W. B.*	4	----	----	----	----	100	5	25	7	75	4	75	3	25	5	----	----	100	5	100	1	100	3	50	6	100	2	100	4
18	Roscommon, W. S. W.	4	0	0	0	0	0	0	0	0	25	2	50	2	0	0	0	0	100	2	75	2	50	2	0	0	50	3	50	3
19	BAY & EASTERN DIV.†	52	25	13	39	6	63	6	0	0	75	5	77	5	80	7	0	0	80	7	96	2	83	5	44	7	94	2	81	4
20	Bay City, W. R. M.	4	0	0	0	0	0	0	0	0	75	4	100	3	100	5	0	0	0	0	100	2	0	0	0	0	100	1	50	7
21	East Saginaw, *B. L. C.*	4	25	13	----	----	100	9	0	0	100	7	100	6	100	9	0	0	100	8	100	1	75	11	0	0	100	2	100	6
22	Lapeer, H. McC.	4	0	0	0	0	0	0	0	0	50	3	75	4	0	0	0	0	0	0	100	2	0	0	0	0	100	1	100	2
23	Lexington, A. M. O.	4	0	0	0	0	25	4	0	0	0	0	50	2	25	4	0	0	0	0	50	1	0	0	0	0	50	3	25	4
24	Port Huron, *J. K. F.*	4	0	0	50	7	75	8	0	0	100	5	100	5	75	8	0	0	0	0	100	2	75	3	50	6	100	1	0	0
25	Port Huron. G. A. S.	4	0	0	25	3	25	4	0	0	50	3	25	4	0	0	0	0	0	0	100	1	0	0	0	0	75	2	100	1
26	Port Huron, A. A. W.	4	----	----	----	----	100	2	----	----	100	5	----	----	100	6	----	----	----	----	100	4	----	----	----	----	100	1	----	----
27	Saginaw City, *E. A. H.*	4	0	0	25	9	25	11	0	0	75	8	25	10	100	9	0	0	75	7	100	3	0	0	25	10	100	1	100	2
28	Saginaw City, N. D. L.	4	0	0	25	5	100	4	0	0	25	7	100	5	100	3	0	0	100	3	100	3	100	5	50	6	100	1	0	0
29	Thornville, J. S. C.	4	0	0	50	7	100	4	0	0	0	0	50	7	50	8	0	0	0	0	100	3	0	0	0	0	100	2	0	0
30	West Bay City, *A. F. H.*	4	0	0	75	6	50	9	0	0	100	5	100	5	50	9	0	0	75	10	100	1	100	3	50	7	100	3	100	5
31	West Bay City, J. W. H.	4	0	0	0	0	25	4	0	0	75	3	100	3	0	0	0	0	50	5	100	3	50	5	0	0	100	1	50	5
32	West Bay City, I. E. R.	4	0	0	25	3	0	0	0	0	75	2	100	5	100	6	0	0	0	0	100	5	100	5	0	0	100	2	100	1
33	CENTRAL DIV.	70	55	8	73	8	56	4	0	0	58	5	68	4	86	6	25	5	39	5	87	3	61	5	69	6	93	1	80	3
34	Charlotte, G. B. A.	3	100	11	100	12	100	4	0	0	100	9	100	9	100	15	0	0	33	15	100	2	33	12	0	0	100	2	100	5
35	Corunna, *J. B.*	4	25	6	0	0	25	5	0	0	0	0	75	3	25	6	25	4	75	3	75	3	25	4	50	4	100	1	100	2
36	DeWitt, G. W. T.	4	0	0	0	0	100	4	0	0	0	0	0	0	100	9	0	0	0	0	100	2	75	7	0	0	100	2	100	3
37	Elsie, E. V. C.	4	----	----	----	----	0	0	0	0	25	4	50	4	0	0	0	0	25	4	100	3	75	5	0	0	100	1	100	3
38	Greenville, *A. W. N.*	4	0	0	50	8	0	0	0	0	75	7	100	6	100	10	0	0	0	0	100	3	50	10	50	11	100	1	100	7

39	**Hastings, A. P. D.**	4	0	0	0	0	0	0	0	0	0	0	25	2	100	3	0	0	0	0	25	2	25	4	0	0	75	1	25	1
40	Hastings, *J. C. L.*	3	0	0	0	0	0	0	0	0	33	2	67	4	0	0	0	0	0	0	67	2	100	2	0	0	100	1	33	2
41	Howell, C. V. B.	4	----	----	----	----	0	0	0	0	0	0	50	2	25	2	0	0	25	2	75	2	0	0	0	0	75	1	0	0
42	Hubbardston, H. W. B.	4	----	----	----	----	0	0	0	0	0	0	0	0	100	4	0	0	0	0	100	2	0	0	0	0	100	2	0	0
43	Ionia, *S. V. R.*	4	0	0	0	0	0	0	0	0	0	0	0	0	100	4	0	0	25	5	100	2	50	3	0	0	100	1	100	1
44	Lansing, *J. H. W.*	4	0	0	0	0	100	7	0	0	100	3	100	4	100	6	0	0	0	0	100	4	0	0	0	0	100	1	100	2
45	Mason, W. W. R.*	4	50	7	100	6	25	6	0	0	100	6	100	4	100	7	0	0	0	0	100	2	100	6	75	7	100	1	100	5
46	Muir, L. S. S.	4	0	0	0	0	0	0	0	0	25	6	0	0	0	0	0	0	75	5	100	4	0	0	0	0	100	1	0	0
47	North Lansing, O. M.	4	0	0	0	0	75	4	0	0	50	4	50	5	75	3	0	0	0	0	100	3	75	2	0	0	100	1	25	4
48	Otisville, A. W. N.	4	0	0	0	0	50	1	0	0	0	0	50	6	100	4	0	0	25	3	75	3	0	0	100	3	100	2	25	6
49	Ovid, O. B. C.	4	0	0	0	0	50	3	0	0	0	0	25	1	0	0	0	0	25	3	50	3	50	2	0	0	25	3	100	1
50	Vernon, D. C. H.	4	0	0	50	5	25	5	0	0	25	6	100	4	100	6	25	6	0	0	100	3	0	0	0	0	100	2	100	1
51	Webberville, R. B. S.	4	0	0	0	0	25	3	0	0	50	3	0	0	0	0	0	0	0	0	100	2	75	2	0	0	100	2	0	0
52	SOUTH-WESTERN DIV. †	*28*	*0*	*0*	*25*	*5*	*75*	*4*	*0*	*0*	*67*	*6*	*79*	*5*	*100*	*5*	*0*	*0*	*50*	*8*	*100*	*3*	*55*	*5*	*67*	*8*	*89*	*2*	*79*	*3*
53	Dayton, R. H.	4	----	----	25	5	0	0	0	0	0	0	0	0	100	5	0	0	0	0	100	3	0	0	25	6	100	2	100	4
54	Mattawan, T. H. B.	4	0	0	0	0	25	4	0	0	75	5	75	4	100	4	0	0	0	0	100	1	75	4	0	0	25	2	0	0
55	Niles, S. B.	4	0	0	0	0	0	0	0	0	100	5	100	4	100	8	0	0	75	8	100	4	25	8	100	10	100	1	100	2
56	Niles, J. S. R.	4	0	0	0	0	0	0	0	0	25	7	100	6	100	4	0	0	0	0	100	2	75	8	75	8	100	2	50	5
57	Niles, *I. S.*	4	----	----	----	----	100	5	----	----	----	----	50	5	100	7	----	----	----	----	100	5	----	----	----	----	100	1	100	2
58	Otsego, M. C.	4	0	0	0	0	0	0	0	0	0	0	100	5	100	5	0	0	25	8	100	3	50	4	0	0	100	3	25	6
59	Paw Paw, J. A.	4	0	0	0	0	100	3	0	0	0	0	50	3	100	3	0	0	0	0	100	3	50	3	0	0	100	1	100	1
60	SOUTH'N-CENTR'L DIV. †	*76*	*50*	*6*	*50*	*6*	*71*	*4*	*63*	*5*	*73*	*4*	*72*	*4*	*96*	*5*	*0*	*0*	*44*	*5*	*85*	*2*	*66*	*4*	*57*	*6*	*99*	*2*	*90*	*3*
61	Adrian, *A. M. S.*	4	0	0	0	0	100	2	50	4	0	0	50	3	50	2	0	0	0	0	100	3	0	0	0	0	100	1	0	0
62	Albion, A. C.	4	0	0	0	0	25	4	0	0	100	1	100	2	100	4	0	0	0	0	100	1	50	4	50	4	100	2	100	2
63	Battle Creek, S. S. F.*	4	---	----	50	10	----	----	----	----	100	5	75	8	100	6	----	----	---	----	100	2	100	3	100	9	100	1	100	4
64	Brooklyn, E. N. P.	4	0	0	0	0	0	0	0	0	0	0	25	2	0	0	0	0	0	0	25	1	25	2	0	0	75	1	0	0
65	Centreville, M. S.	4	0	0	75	5	50	5	0	0	50	5	100	4	0	0	0	0	0	0	100	3	50	6	0	0	100	1	100	2
66	Clinton, A. W. A.	4	0	0	25	4	25	6	75	5	0	0	50	6	100	2	0	0	0	0	50	4	25	5	50	5	100	3	75	5
67	Coldwater, *L. H. W.*	4	0	0	25	8	75	6	0	0	100	4	25	5	100	7	0	0	0	0	100	2	100	4	50	7	100	3	75	3
68	Hillsdale, J. W. F.*	4	0	0	50	5	0	0	0	0	50	5	100	4	100	4	0	0	0	0	100	2	100	4	100	4	100	2	100	3
69	Hudson, A. R. S.	4	0	0	100	6	100	5	0	0	50	3	75	3	100	7	0	0	0	0	100	2	0	0	0	0	100	2	100	3
70	Jackson (Pris.) E. L. K.	4	----	----	----	----	100	2	----	----	----	----	25	6	100	4	----	----	25	1	50	1	----	----	25	7	100	3	----	----
71	Jackson, W. W.	4	0	0	0	0	0	0	0	0	50	5	75	4	100	2	0	0	25	8	75	3	0	0	0	0	100	2	100	3
72	Kalamazoo, W. B. S.	4	0	0	0	0	0	0	0	0	100	5	75	6	100	8	0	0	0	0	100	3	100	6	0	0	100	1	100	5
73	Marshall, H. L. J.	4	0	0	0	0	0	0	0	0	0	0	75	2	0	0	0	0	0	0	100	2	0	0	0	0	0	0	0	0
74	Marshall, *J. F. S.*	4	----	----	25	2	25	2	----	----	75	4	100	4	----	----	----	----	50	5	100	2	75	3	25	4	100	2	----	----
75	Mendon, H. C. C.	4	0	0	0	0	100	4	0	0	0	0	100	4	100	5	0	0	0	0	75	2	75	4	0	0	100	1	25	3
76	Mendon, E. S.	4	0	0	0	0	50	3	0	0	0	0	75	3	0	0	0	0	0	0	50	3	0	0	0	0	100	2	100	2
77	Three Rivers, C. W. B.	4	0	0	0	0	100	5	0	0	0	0	100	7	100	10	0	0	0	0	100	3	0	0	0	0	100	1	100	2
78	Union City, N. H. C.	4	0	0	0	0	100	4	0	0	50	5	0	0	0	0	0	0	75	4	100	2	25	6	0	0	100	1	0	0
79	Ypsilanti, E. B.*	4	50	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	1	6	0
80	SOUTH-EASTERN DIV. †	*40*	*100*	*14*	*56*	*7*	*75*	*6*	*0*	*0*	*81*	*4*	*85*	*4*	*100*	*5*	*0*	*0*	*56*	*9*	*100*	*2*	*65*	*5*	*42*	*8*	*100*	*2*	*86*	*4*
81	Detroit (E. D.) J. B.	4	0	0	0	0	25	4	0	0	100	2	75	1	100	4	0	0	25	4	100	2	0	0	0	0	100	2	50	3
82	Detroit, W. H. R.	4	100	14	100	11	100	11	0	0	100	2	100	3	100	7	0	0	100	20	100	1	100	9	100	18	100	4	100	5
83	Milford, R. J.	4	0	0	0	0	0	0	0	0	0	0	75	5	100	4	0	0	0	0	100	2	25	3	0	0	100	2	0	0
84	Monroe, *A. I. S.*	4	----	----	75	3	100	5	0	0	100	2	100	2	100	4	0	0	75	3	100	1	75	3	50	6	100	3	100	3
85	Northville, J. M. S.	4	0	0	0	0	0	0	0	0	25	3	75	3	100	4	0	0	0	0	100	3	0	0	25	3	100	2	100	2
86	Pontiac, W. G. E.*	4	0	0	0	0	100	6	0	0	100	7	100	4	100	9	0	0	25	10	100	2	0	0	25	7	100	1	75	5
87	Trenton, W. C.	4	0	0	25	6	0	0	0	0	75	4	100	4	0	0	0	0	0	0	100	4	0	0	0	0	100	1	100	2
88	Utica, G. G. R.	4	----	----	25	7	50	6	0	0	50	7	75	6	100	7	0	0	0	0	100	2	100	5	25	6	100	2	100	3
89	Washington, A. Y.	4	0	0	0	0	100	5	----	----	0	0	50	6	100	4	0	0	0	0	100	4	25	6	25	7	100	5	100	6
90	Wyandotte, E. P. C.	4	0	0	0	0	50	5	0	0	100	3	100	4	100	5	0	0	0	0	100	1	0	0	0	0	100	2	50	3

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*, †, ‡, §, ‖. For these references, see footnotes on page 327.

TABLE 3.—*Diseases by Localities in Michigan, Four Weeks ending* **July 31**, *1880.*—CONTINUED.

LINE NUMBER.¶	Fever, Typhoid (Enteric.)		Fever, Typho-Malarial.		Influenza.		Measles.		Neuralgia.		Pneumonia.		Puerperal Fever.		Rheumatism.		Scarlatina.		Small-pox.		Tonsillitis.		Whooping Cough.	
	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	57	6.9	54	6.1	54	5.5	65	5.0	76	5.1	48	6.3	32	9.0	76	5.4	49	7.6	0	0	62	5.6	79	4.9
2	0	0	0	0	75	4	25	5	50	3	50	4	0	0	50	4	0	0	0	0	75	3	100	2
3	0	0	0	0	0	0	25	4	50	3	25	3	0	0	75	3	0	0	0	0	75	3	100	1
4	0	0	0	0	75	4	25	6	0	0	75	5	0	0	25	5	0	0	0	0	0	0	100	2
5	0	0	50	10	0	0	0	0	75	8	25	6	50	6	100	6	0	0	0	0	50	7	100	4
6	----	----	----	----	----	----	----	----	50	7	25	6	50	6	100	5	----	----	----	----	75	5	100	4
7	0	0	50	10	0	0	0	0	100	8	0	0	0	0	100	7	0	0	0	0	25	8	0	0
8	75	16	73	8	100	12	58	7	96	6	71	10	25	19	61	6	91	10	0	0	60	8	87	10
9	0	0	100	5	0	0	25	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	100	4	0	0	0	0	25	4	0	0	0	0	25		100	1
11	0	0	0	0	0	0	75	4	75	9	50	10	0	0	25	7	100	5	0	0	50	8	0	0
12	0	0	25	4	0	0	0	0	100	5	0	0	0	0	25	7	0	0	0	0	0	0	100	6
13	0	0	0	0	0	0	0	0	100	5	0	0	0	0	100	4	0	0	0	0	0	0	0	0
14	0	0	67	14	100	5	0	0	100	6	100	9	0	0	100	8	100	13	0	0	67	7	67	15
15	75	16	100	10	100	18	75	13	100	6	0	0	25	19	100	7	75	13	0	0	100	9	75	18
16	0	0	0	0	0	0	50	7	38	4	25	4	0	0	63	6	0	0	0	0	100	4	100	1
17	----	----	----	----	----	----	50	7	50	5	25	4	----	----	100	6	----	----	----	----	100	4	----	----
18	0	0	0	0	0	0	0	0	25	2	0	0	0	0	25	5	0	0	0	0	0	0	100	1
19	0	0	47	6	38	6	50	6	77	5	40	7	25	1	80	6	33	3	0	0	79	6	57	5
20	0	0	0	0	0	0	0	0	100	5	0	0	0	0	100	7	0	0	0	0	0	0	0	0
21	0	0	0	0	100	6	0	0	100	6	0	0	0	0	100	8	0	0	0	0	100	9	0	0
22	0	0	0	0	0	0	0	0	75	4	25	5	0	0	25	5	0	0	0	0	0	0	25	5
23	0	0	25	4	0	0	0	0	0	0	0	0	0	0	0	0	25	2	0	0	25	3	0	0
24	0	0	50	6	25	5	0	0	100	6	0	0	0	0	75	5	25	4	0	0	75	7	50	3
25	0	0	25	2	25	3	0	0	25	4	0	0	0	0	0	0	50	4	0	0	0	0	0	0
26	----	----	25	7	----	----	----	----	----	----	25	6	----	----	100	3	----	----	----	----	----	----	25	4
27	0	0	100	8	25	8	0	0	100	5	0	0	0	0	100	5	0	0	0	0	100	7	50	6
28	9	0	0	0	0	0	0	0	100	2	50	6	0	0	100	5	0	0	0	0	100	4	100	4
29	0	0	25	7	0	0	0	0	100	5	50	7	25	1	100	6	0	0	0	0	100	6	100	2
30	0	0	25	12	25	8	25	11	75	8	50	10	0	0	75	11	0	0	0	0	0	0	50	10
31	0	0	0	0	25	3	100	3	50	5	----	----	0	0	25	6	0	0	0	0	0	0	0	0
32	0	0	100	4	0	0	25	3	25	5	0	0	0	0	0	0	0	0	0	0	50	5	0	0
33	46	5	59	6	42	4	61	5	69	6	48	6	29	13	66	5	25	7	0	0	58	6	90	5
34	0	0	67	14	100	3	33	12	100	7	100	12	33	16	100	8	0	0	0	0	100	8	0	0
35	25	3	25	3	25	6	25	3	0	0	0	0	0	0	25	4	25	6	0	0	0	0	100	4
36	75	8	0	0	0	0	0	0	100	6	0	0	0	0	100	9	0	0	0	0	100	5	100	8
37	0	0	0	0	0	0	0	0	50	6	0	0	0	0	25	5	0	0	0	0	----	----	0	0

	DISEASES REPORTED WHICH WERE NOT PRINTED ON THE BLANKS, AMOUNT OF SICKNESS, ETC.¶	Per cent of Weeks Present.‡	Av. Order of Prev. when Present.§
6	Hemiplegia, one case.		
10	Stomatitis	25	5
	Dyspepsia	25	4
20	Summer sickness mostly, 4 weeks ending July 31. Mostly children, July 31.		
25	Diarrhea marked malarial, July 17.		
26	Roseola	100	4
28	Very healthy for this time of year, except that consumption is increasing,—2 weeks ending July 31.		
30	Heart disease	25	11
	Bowel difficulties generally seem to come on earlier than usual, and are assuming a severe type.		
31	Congestion of brain	25	5
	Congestion of lungs	25	5
32	Sporadic cholera, one case, very severe, recovery,—July 17 and 31.		
42	Porrigo	25	5
48	Pharyngitis	50	3
	Asthma	50	4
55	Quite healthy, July 24.		
58	Less sickness than a year ago, July 31.		
59	Dyspepsia, hepatitis, each	50	4
	Gonorrhea	50	6
	Albuminuria	75	3
	Vaginitis, cystitis, gastrodynia, asthma, each	25	4
	Leucorrhea, perityphlitis, each	25	3
66	Carditis	25	9
68	Two cases sunstroke, one death, diseases usually mild, July 17. Sickness increasing in amount, not severe, July 24.		
69	Conjunctivitis, catarrhal	50	3
70	Syphilis	25	5
	Sickness light, July 10 and 17.		
	During the week ending July 31 there was a sudden increase of remittent fever, which seemed to be temporary in nature. During this week also a temporary and sudden onset of diarrhea took place, attended with fever and great pain, and from		

38	0	0	100	5	0	0	100	3	50	9	0	0	25	10	50	8	0	0	0	0	50	13	100	9
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	4	0	0	0	0	0	0	100	3
40	0	0	33	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67	4
41	0	0	0	0	50	2	50	1	----	----	0	0	0	0	50	2	----	----	0	0	50	2	----	----
42	50	4	0	0	0	0	0	0	----	----	0	0	0	0	50	3	0	0	0	0	25	6	0	0
43	75	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	25	8	75	6	0	0	25	4	0	0	25	7	0	0	75	7	0	0	0	0	0	0	0	0
45	0	0	50	7	25	6	100	5	100	6	25	7	0	0	100	6	25	7	0	0	100	3	100	4
46	0	0	0	0	0	0	0	0	100	3	0	0	0	0	100	2	0	0	0	0	0	0	0	0
47	25	3	0	0	0	0	100	4	25	5	75	4	0	0	75	4	0	0	0	0	25	5	100	1
48	0	0	0	0	0	0	50	5	50	6	0	0	0	0	50	5	0	0	0	0	25	4	----	----
49	0	0	0	0	0	0	0	0	25	4	50	4	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	100	4	0	0	0	0	100	4	0	0	0	0	0	0	0	0
51	0	0	0	0	25	3	0	0	0	0	25	3	0	0	25	4	0	0	0	0	0	0	50	4
52	*100*	*8*	*25*	*6*	*75*	*3*	*75*	*6*	*83*	*5*	*25*	*7*	*0*	*0*	*92*	*6*	*25*	*5*	*0*	*0*	*33*	*5*	*63*	*2*
53	0	0	25	6	0	0	0	0	50	5	0	0	0	0	0	0	25	5	0	0	0	0	100	1
54	0	0	25	6	75	3	0	0	100	2	25	7	0	0	100	4	0	0	0	0	25	5	0	0
55	0	0	25	5	0	0	100	7	100	8	0	0	0	0	100	13	0	0	0	0	0	0	0	0
56	100	8	25	7	0	0	0	0	100	5	0	0	0	0	100	5	0	0	0	0	50	7	0	0
57	----	----	----	----	----	----	50	5	100	5	----	----	----	----	50	8	----	----	----	----	----	----	25	3
58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	5	0	0	0	0	0	0	100	1
59	0	0	0	0	0	0	0	0	50	3	0	0	0	0	100	3	0	0	0	0	25	3	25	4
60	*25*	*5*	*75*	*5*	*44*	*5*	*100*	*4*	*70*	*5*	*38*	*5*	*38*	*7*	*78*	*5*	*33*	*7*	*0*	*0*	*50*	*4*	*83*	*5*
61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	1	0	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0	0	100	4	0	0	0	0	100	4	0	0	0	0	0	0	0	0
63	----	----	----	----	----	----	----	----	100	8	----	----	----	----	100	7	----	----	----	----	----	----	----	----
64	0	0	50	3	0	0	0	0	0	0	0	0	0	0	50	2	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	50	4	0	0	25	5	75	4	0	0	0	0	0	0	0	0
66	0	0	75	7	0	0	0	0	0	0	25	3	50	8	100	4	25	6	0	0	0	0	0	0
67	0	0	0	0	25	8	0	0	75	5	0	0	0	0	75	6	25	7	0	0	25	6	25	8
68	0	0	0	0	25	3	100	2	100	4	0	0	0	0	100	4	0	0	0	0	0	0	100	3
69	25	6	100	4	25	4	0	0	100	5	0	0	0	0	100	5	0	0	0	0	0	0	0	0
70	----	----	----	----	----	----	----	----	25	6	----	----	----	----	100	4	----	----	----	----	100	6	----	----
71	0	0	0	0	0	0	100	6	0	0	75	6	0	0	100	7	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	8	0	0	0	0	100	2
73	0	0	0	0	0	0	100	2	25	4	0	0	0	0	25	5	0	0	0	0	0	0	75	4
74	----	----	----	----	----	----	100	2	100	4	25	4	----	----	100	4	----	----	----	----	75	4	100	2
75	0	0	0	0	0	0	0	0	25	4	25	6	0	0	0	0	0	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0	0	50	4	0	0	0	0	0	0	0	0	0	0	25	3	0	0
77	0	0	0	0	100	4	100	8	100	6	0	0	0	0	100	9	0	0	0	0	0	0	100	10
78	0	0	0	0	0	0	0	0	100	2	0	0	0	0	75	4	0	0	0	0	0	0	0	0
79	25	3	0	0	0	0	0	0	25	3	0	0	0	0	25	2	0	0	0	0	25	2	0	0
80	*75*	*8*	*55*	*4*	*88*	*7*	*63*	*4*	*94*	*6*	*70*	*7*	*25*	*7*	*93*	*6*	*100*	*19*	*0*	*0*	*70*	*6*	*75*	*6*
81	75	4	25	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	4
82	100	17	0	0	100	7	0	0	100	10	100	12	0	0	100	15	100	19	0	0	100	8	100	17
83	100	5	0	0	0	0	75	2	0	0	0	0	0	0	0	0	0	0	0	0	25	5	75	3
84	0	0	25	4	75	6	50	5	100	5	75	5	0	0	100	5	0	0	0	0	75	5	0	0
85	0	0	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0	0	0	0	100	8	0	0	100	4	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	25	7	0	0	75	6	0	0	0	0	0	0	25	3
88	0	0	100	7	0	0	0	0	75	5	0	0	0	0	100	4	0	0	0	0	75	5	----	----
89	0	0	0	0	0	0	0	0	100	5	0	0	25	7	100	3	0	0	0	0	75	6	75	1
90	25	6	25	5	0	0	0	0	0	0	50	5	0	0	75	4	0	0	0	0	0	0	0	0

71 { its symptoms seemed to have more or less of an enteritis in its composition. I could not trace it to any decided change in atmosphere as I could the increase of bronchial and pulmonary troubles during the following week, by a suddenly depressed temperature with a cold north wind Tuesday and Wednesday, and I think Monday of that week. The week previous to that was ordinary summer weather, and was attended with the diarrhea, etc., spoken of.—*Jackson, Aug. 9, 1880.*—W. WORSFOLD.

77 Continues healthy.

78 { One death from jaundice, week ending July 10.

79 { Very little sickness, 2 weeks ending July 24. No sickness; particularly healthy among children, July 31.

82 { Considerable diarrheal ailments among children, otherwise healthy, July 10. Diarrheal troubles most common and rather severe, July 17. Not so much sickness as at last report, July 24, and again July 31.

89			
89	Spinal meningitis	100	6
	Dyspepsia	100	1
	Malaria	75	4
	Cystitis	50	5

NOTE.—No special diseases during month of July.—J. M. LOOP, M. D., *Port Sanilac, Aug. 7, 1880.*

On his meteorological register for July, 1880, Dr. E. S. Richardson, of Reed City, wrote: "Following this cold damp weather was diphtheria in its most malignant form."

‡, §. For these references, see page 327.

¶ The several numbered lines on these two pages continue statements for the localities and divisions which are named and have the same line-numbers on the two preceding pages. On the right side of the page the numbers before the side-notes are the line-numbers of the localities on pages 352-3, to which the side-notes refer.

TABLE 3.—CONTINUED.—*Diseases by Localities in Michigan, Four Weeks ending* **August** *28, 1880.*

LINE NUMBER.	DIVISIONS AND LOCALITIES REPRESENTED, AND INITIALS OF PHYSICIANS WHO REPORTED.* (Health Officers in Italics; those also Correspondents marked with a*.)	Reports Received.	Brain, Inflammati'n of.		Bowels, Inflammati'n of.		Bronchitis.		Cerebro-Spinal Men'gitis.		Cholera Infantum.		Cholera Morbus.		Consumption, Pulmonary.		Croup, Membranous.		Diphtheria.		Diarrhea.		Dysentery.		Erysipelas.		Fever, Intermittent.		Fever, Remittent.	
			Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present ‡	Av Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av Order of Prevalence when Present.§
1	ALL LOCALITIES........‖	308	51	8.3	68	6.3	81	5.2	31	6.4	75	4.5	75	4.8	87	6.5	31	12.4	55	6.8	94	2.5	74	4.7	60	7.6	95	1.9	89	3.2
2	UPPER-PENIN. DIV.....†	*8*	*0*	*0*	*63*	*5*	*0*	*0*	*0*	*0*	*100*	*2*	*100*	*2*	*100*	*3*	*50*	*4*	*0*	*0*	*100*	*1*	*88*	*2*	*50*	*5*	*25*	*5*	*0*	*0*
3	Central Mine, G. W. O.	4	----	----	75	4	0	0	0	0	100	3	100	3	0	0	0	0	0	0	100	1	75	3	25	4	0	0	0	0
4	Houghton, H. W. J.....	4	0	0	50	5	0	0	0	0	100	1	100	1	100	3	50	4	0	0	100	1	100	1	75	5	25	5	0	0
5	NORTH-WESTERN DIV..†	*8*	*0*	*0*	*0*	*0*	*25*	*5*	*0*	*0*	*100*	*2*	*63*	*4*	*25*	*11*	*0*	*0*	*100*	*4*	*100*	*3*	*100*	*5*	*50*	*10*	*100*	*3*	*75*	*4*
6	Cadillac, *J. L.*.....	4	0	0	0	0	25	3	0	0	0	0	25	5	0	0	0	0	100	4	100	2	100	4	0	0	100	1	75	3
7	Manistee, *G. La. M.*...	4	0	0	0	0	25	7	0	0	100	2	100	3	25	11	0	0	0	0	100	3	100	5	50	10	100	4	75	5
8	WESTERN DIVISION....†	*24*	*0*	*0*	*63*	*9*	*100*	*10*	*0*	*0*	*79*	*5*	*80*	*5*	*100*	*9*	*25*	*20*	*75*	*10*	*100*	*3*	*81*	*5*	*58*	*9*	*100*	*2*	*88*	*3*
9	Cedar Springs, C. S. F..	4	0	0	0	0	0	0	0	0	100	5	100	4	0	0	0	0	0	0	100	5	100	6	25	6	100	1	100	2
10	Drenthe, H. K.	4	0	0	25	5	100	4	0	0	100	4	100	4	0	0	0	0	0	0	100	3	0	0	50	6	100	2	50	5
11	Grand Haven, *A. V.*...*	4	0	0	0	0	0	0	0	0	100	2	75	6	0	0	0	0	50	8	100	4	100	7	0	0	100	4	0	0
12	Grand Rapids, A. H....	4	0	0	0	0	0	0	0	0	25	5	25	6	100	5	0	0	100	5	100	4	0	0	0	0	100	2	100	1
13	Ludington, *A. P. McC.*	4	0	0	0	0	0	0	0	0	50	6	0	0	100	6	0	0	0	0	100	3	25	5	0	0	100	1	0	0
14	Muskegon, *O. C. W.*....	4	0	0	100	12	100	15	0	0	100	10	100	7	100	16	25	20	75	17	100	1	100	3	100	15	100	2	100	5
15	NORTH'N-CENTRAL DIV.†	*8*	*0*	*0*	*0*	*0*	*75*	*5*	*0*	*0*	*75*	*5*	*100*	*5*	*0*	*0*	*0*	*0*	*50*	*4*	*63*	*2*	*63*	*4*	*25*	*6*	*100*	*1*	*100*	*3*
16	Big Rapids, *I. W. B.*...	4	----	----	0	0	75	5	0	0	75	5	100	5	0	0	0	0	75	5	75	2	100	6	25	6	100	1	100	3
17	Roscommon, W. S. W..	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	50	2	25	2	0	0	0	0	0	0
18	BAY AND EASTERN DIV.†	*51*	*55*	*10*	*71*	*6*	*94*	*6*	*33*	*11*	*90*	*4*	*77*	*5*	*74*	*7*	*43*	*9*	*53*	*7*	*96*	*2*	*69*	*6*	*58*	*8*	*90*	*2*	*94*	*4*
19	Bay City, W. R. M......	4	0	0	75	6	0	0	0	0	100	4	100	3	100	5	0	0	0	0	100	2	0	0	0	0	100	1	100	6
20	East Saginaw, *B. L. C.*.	3	67	12	0	0	100	11	33	11	100	4	100	6	67	11	33	13	100	5	100	1	67	9	0	0	100	2	100	7
21	Lapeer, *H. McC.*.........	4	----	----	25	5	50	5	0	0	100	3	100	4	0	0	0	0	0	0	100	2	25	4	0	0	100	1	100	2
22	Lexington, A. M. O.....	4	0	0	0	0	100	4	0	0	0	0	75	2	25	4	50	4	0	0	50	3	0	0	0	0	50	3	0	0
23	Port Huron, *J. K. F.*...	4	0	0	75	5	100	4	0	0	100	4	100	6	75	7	0	0	0	0	100	2	100	4	100	4	100	1	50	1
24	Port Huron, A. A. W...	4	----	----	----	----	100	3	----	----	----	----	----	----	100	5	----	----	----	----	100	2	----	----	----	----	100	1	----	----
25	Port Sanilac, J. M. L...	4	----	----	----	----	----	----	----	----	25	2	25	2	----	----	----	----	----	----	100	1	25	2	----	----	25	3	----	----
26	Saginaw City, *E. A. H.*	4	0	0	0	0	0	0	0	0	100	6	75	9	100	10	0	0	0	0	100	3	50	8	50	11	100	1	100	3
27	Saginaw City, N. D. L.	4	50	8	100	6	100	5	0	0	100	5	100	7	100	5	0	0	75	7	100	3	100	7	25	8	100	1	0	0
28	Thornville, J. S. C......	4	0	0	25	6	100	5	0	0	0	0	50	6	25	8	0	0	0	0	100	3	100	5	0	0	100	3	0	0
29	West Bay City, *A. F. H.*	4	50	9	100	9	100	9	0	0	75	5	25	6	50	11	0	0	50	12	100	3	100	7	0	0	100	2	100	5
30	West Bay City, J. W. H.	4	0	0	0	0	0	0	0	0	100	3	75	4	0	0	0	0	25	5	100	2	25	4	0	0	100	1	100	2
31	West Bay City, I. E. R.	4	0	0	100	4	0	0	0	0	100	1	100	5	100	6	0	0	25	4	100	5	100	6	0	0	100	2	100	2
32	CENTRAL DIVISION.....†	*69*	*58*	*8*	*60*	*7*	*88*	*5*	*0*	*0*	*66*	*5*	*66*	*5*	*89*	*6*	*0*	*0*	*58*	*5*	*88*	*2*	*70*	*5*	*39*	*6*	*97*	*1*	*90*	*3*
33	Charlotte, G. B. A......	4	100	12	100	10	100	4	0	0	100	10	100	9	100	15	0	0	0	0	100	2	100	13	0	0	100	1	100	5
34	Corunna, *J. B.*..........	4	0	0	0	0	75	4	0	0	25	5	50	4	25	3	0	0	75	4	100	3	0	0	50	5	100	1	100	2
35	DeWitt, G. W. T........	4	0	0	0	0	100	6	0	0	75	6	75	8	100	8	0	0	0	0	100	2	100	3	0	0	100	2	100	4
36	Elsie, E. V. C...........	4	0	0	0	0	0	0	0	0	25	4	0	0	0	0	0	0	0	0	100	2	75	3	0	0	75	3	100	2
37	Greenville, *A. W. N.*..	3	0	0	0	0	67	11	0	0	100	7	100	4	100	11	0	0	0	0	100	2	100	7	33	11	100	1	100	6
38	Hastings, A. P. D.......	4	0	0	0	0	0	0	0	0	0	0	0	0	100	4	0	0	50	5	100	2	25	5	0	0	100	1	0	0

39	Howell, C. V. B.	4	0	0	0	0	50	2	0	0	0	0	50	2	0	0	0	0	0	0	25	2	25	2	0	0	75	1	50	2
40	Hubbardston, H. W. B.	4	----	----	----	----	0	0	0	0	0	0	0	0	100	7	0	0	0	0	100	3	0	0	0	0	100	1	75	2
41	Ionia (H. of C.) W. F. R.	4	50	6	25	6	0	0	0	0	0	0	25	4	100	5	0	0	0	0	100	2	75	4	25	5	100	2	100	5
42	Ionia, *S. V. R.*	4	0	0	0	0	0	0	0	0	0	0	25	5	100	5	0	0	0	0	100	3	100	4	0	0	100	1	100	1
43	Lansing, *J. H. W.*	4	0	0	0	0	100	6	0	0	100	2	100	3	100	5	0	0	0	0	100	1	100	5	0	0	100	1	100	1
44	Mason, *W. W. R.* *	3	0	0	100	6	100	4	0	0	100	6	100	4	100	7	0	0	33	9	100	2	67	6	67	6	100	2	100	5
45	Muir, L. S. S.	4	0	0	25	5	0	0	0	0	50	4	75	5	0	0	0	0	0	0	50	5	25	3	0	0	100	1	0	0
46	North Lansing, O. M.	4	25	5	0	0	100	5	0	0	50	5	100	4	100	3	0	0	0	0	100	2	100	3	0	0	100	2	100	3
47	Otisville, A. W. N.	4	0	0	0	0	100	2	0	0	0	0	25	6	100	5	0	0	100	4	100	2	0	0	25	5	100	2	75	4
48	Ovid, O. B. C.	4	----	----	----	----	----	----	----	----	----	----	25	4	----	----	----	----	25	3	25	3	74	2	----	----	----	----	50	3
49	Vernon, D. C. H.	3	0	0	0	0	0	0	0	0	0	0	100	4	100	6	0	0	0	0	100	1	33	5	0	0	100	2	100	1
50	Webberville, R. B. S.	4	0	0	0	0	0	0	0	0	50	4	0	0	25	4	0	0	0	0	100	2	50	4	0	0	100	1	100	4
51	SOUTH-WESTERN DIV. †	*26*	*0*	*0*	*0*	*0*	*50*	*5*	*0*	*0*	*57*	*6*	*89*	*6*	*100*	*6*	*0*	*0*	*25*	*14*	*96*	*3*	*83*	*5*	*100*	*9*	*100*	*2*	*81*	*3*
52	Dayton, R. H.	4	----	----	----	----	0	0	0	0	25	4	0	0	100	5	0	0	0	0	100	3	0	0	0	0	100	2	100	2
53	Mattawan, T. H. B.	2	0	0	0	0	0	0	0	0	100	5	100	4	100	7	0	0	0	0	100	1	100	3	0	0	100	4	50	5
54	Niles, S. B.	4	0	0	0	0	0	0	0	0	100	8	75	7	100	7	0	0	25	14	100	5	100	7	100	9	100	1	100	2
55	Niles, J. S. R.	4	0	0	0	0	75	5	0	0	0	0	100	9	100	5	0	0	0	0	100	6	100	11	0	0	100	1	75	2
56	Niles, *I. S.*	4	0	0	0	0	75	6	0	0	25	5	75	5	100	7	0	0	0	0	75	4	0	0	0	0	100	1	100	2
57	Otsego, M. C.	4	0	0	0	0	25	4	0	0	0	0	100	6	100	6	0	0	0	0	100	1	100	2	0	0	100	4	25	4
58	Paw Paw, J. A.	4	0	0	0	0	25	4	0	0	0	0	0	0	100	4	0	0	0	0	100	3	25	3	0	0	100	2	100	1
59	SOUTH'N-CENTRAL DIV. †	*74*	*36*	*6*	*72*	*5*	*92*	*4*	*33*	*6*	*59*	*4*	*77*	*5*	*83*	*7*	*0*	*0*	*31*	*6*	*99*	*2*	*64*	*4*	*77*	*7*	*99*	*2*	*89*	*3*
60	Adrian, *A. M. S.*	2	0	0	0	0	100	4	50	5	0	0	100	5	50	5	0	0	0	0	100	2	0	0	50	5	100	1	100	4
61	Albion, A. C.	2	50	4	0	0	50	4	0	0	100	2	100	4	100	4	0	0	0	0	100	2	100	4	100	4	100	2	100	1
62	Battle Creek, *S. S. F.* *	4	----	----	----	----	----	----	----	----	100	5	100	5	75	7	----	----	----	----	100	3	100	5	75	10	100	2	100	3
63	Blissfield, R. B. C. N.	4	0	0	0	0	75	4	25	4	75	3	50	4	0	0	0	0	50	4	100	3	0	0	0	0	100	1	100	3
64	Brooklyn, E. N. P.	4	0	0	0	0	0	0	0	0	50	3	25	4	0	0	0	0	25	4	100	1	50	4	0	0	100	3	100	5
65	Centerville, M. S.	4	25	4	25	5	50	5	50	4	0	0	100	3	0	0	0	0	0	0	100	3	25	4	0	0	100	1	100	2
66	Clinton, A. W. A.	4	0	0	0	0	0	0	0	0	0	0	75	5	100	5	0	0	0	0	75	3	25	4	75	7	100	5	50	7
67	Coldwater, *L. A. W.*	4	50	13	100	9	100	7	25	12	100	6	75	10	100	11	0	0	0	0	100	2	100	6	100	12	100	4	100	2
68	Hillsdale, *J. W. F.**	4	0	0	100	5	100	5	0	0	25	4	100	3	25	5	0	0	0	0	100	1	100	4	100	4	100	2	100	2
69	Hudson, A. R. S.	2	0	0	100	5	100	5	0	0	50	4	50	3	50	8	0	0	0	0	100	2	0	0	50	7	100	2	100	3
70	Jackson (Pris.) E. L. K.	4	----	----	----	----	100	1	----	----	----	----	----	----	100	4	----	----	----	----	100	2	----	----	----	----	100	3	----	----
71	Jackson, W. W.	4	0	0	0	0	100	3	0	0	25	6	25	5	100	5	0	0	25	9	100	4	0	0	0	0	100	2	100	2
72	Kalamazoo, W. B. S.	4	0	0	0	0	0	0	0	0	100	4	100	6	100	9	0	0	0	0	100	4	100	7	0	0	100	1	100	4
73	Marshall, H. L. J.	4	0	0	0	0	0	0	0	0	50	4	100	2	0	0	0	0	0	0	100	1	0	0	0	0	75	3	50	5
74	Marshall, *I. F. S.*	4	25	4	50	3	100	3	25	4	75	2	100	3	----	----	----	----	----	----	100	1	75	2	----	----	100	1	50	4
75	Mendon, H. C. C.	4	0	0	0	0	100	6	0	0	0	0	100	4	100	7	0	0	0	0	100	3	25	4	0	0	100	1	75	3
76	Mendon, E. S.	4	0	0	0	0	100	3	----	----	50	4	50	6	0	0	0	0	0	0	100	2	25	4	0	0	100	1	100	4
77	Three Rivers, C. W. B.	4	0	0	0	0	100	4	0	0	25	7	100	6	100	10	0	0	0	0	100	4	0	0	0	0	100	1	100	2
78	Union City, N. H. C.	4	0	0	0	0	100	4	0	0	50	9	50	9	50	9	0	0	25	8	100	2	100	3	50	9	100	1	0	0
79	Ypsilanti, *E. B.* *	4	0	0	0	0	0	0	0	0	25	2	0	0	0	0	0	0	0	0	0	0	25	3	0	0	100	1	0	0
80	SOUTH-EASTERN DIV.—†	*40*	*58*	*10*	*69*	*8*	*60*	*7*	*25*	*6*	*93*	*5*	*67*	*4*	*97*	*5*	*75*	*21*	*63*	*8*	*95*	*2*	*86*	*5*	*63*	*10*	*90*	*2*	*92*	*3*
81	Detroit (E. D.) J. B.	4	0	0	0	0	25	4	0	0	75	2	25	2	75	4	0	0	0	0	100	1	0	0	0	0	100	1	25	2
82	Detroit, W. H. R.	4	100	16	100	12	100	7	0	0	100	8	100	8	100	7	75	21	100	16	100	4	100	11	100	17	100	2	100	3
83	Milford, R. J.	4	25	5	0	0	0	0	0	0	0	0	50	5	100	4	0	0	0	0	100	2	100	3	0	0	100	1	0	0
84	Monroe, *A. I. S.*	4	50	10	100	4	25	9	25	6	100	3	75	2	100	4	0	0	75	3	100	1	100	3	75	9	100	3	100	5
85	Northville, J. M. S.	4	0	0	0	0	0	0	0	0	75	5	0	0	100	5	0	0	0	0	50	3	100	4	0	0	75	3	100	2
86	Pontiac, *W. G. E.* *	4	0	0	50	8	75	9	0	0	100	6	100	3	100	10	0	0	0	0	100	2	100	6	50	8	100	1	100	4
87	Trenton, W. C.	4	0	0	0	0	0	0	0	0	100	6	25	7	0	0	0	0	25	8	100	4	50	5	0	0	100	1	100	2
88	Utica, G. G. R.	4	0	0	25	7	0	0	0	0	0	0	100	5	100	7	0	0	0	0	100	1	100	5	25	6	100	2	100	3
89	Washington, A. Y.	4	0	0	0	0	75	4	25	5	0	0	25	5	100	3	0	0	0	0	100	3	50	5	0	0	25	5	100	5
90	Wyandotte, E. P. C.	4	0	0	0	0	0	0	0	0	100	2	100	3	100	4	0	0	50	5	100	1	75	2	0	0	100	2	100	2

*, †, ‡, §, ‖. For these references, see footnotes on page 327.

TABLE 3.—*Diseases, by Localities in Michigan, Four Weeks ending Saturday* **August** *28, 1880.*—CONTINUED.

LINE NUMBER.¶	Fever, Typhoid (Enteric.) Per cent of Weeks Present.‡	Fever, Typhoid (Enteric.) Av. Order of Prevalence when Present.§	Fever, Typho-Malarial. Per cent of Weeks Present.‡	Fever, Typho-Malarial. Av. Order of Prevalence when Present.§	Influenza. Per cent of Weeks Present.‡	Influenza. Av. Order of Prevalence when Present.§	Measles. Per cent of Weeks Present.‡	Measles. Av. Order of Prevalence when Present.§	Neuralgia. Per cent of Weeks Present.‡	Neuralgia. Av. Order of Prevalence when Present.§	Pneumonia. Per cent of Weeks Present.‡	Pneumonia. Av. Order of Prevalence when Present.§	Puerperal Fever. Per cent of Weeks Present.‡	Puerperal Fever. Av. Order of Prevalence when Present.§	Rheumatism. Per cent of Weeks Present.‡	Rheumatism. Av. Order of Prevalence when Present.§	Scarlatina. Per cent of Weeks Present.‡	Scarlatina. Av. Order of Prevalence when Present.§	Small-pox. Per cent of Weeks Present.‡	Small-pox. Av. Order of Prevalence when Present.§	Tonsillitis. Per cent of Weeks Present.‡	Tonsillitis. Av. Order of Prevalence when Present.§	Whooping Cough. Per cent of Weeks Present.‡	Whooping Cough. Av. Order of Prevalence when Present.§
1	68	6.6	65	5.7	76	4.4	59	7.0	77	5.4	46	7.3	38	8.5	83	5.7	58	6.4	0	0	61	5.7	70	5.0
2	*50*	*4*	*0*	*0*	*0*	*0*	*0*	*0*	*100*	*5*	*25*	*6*	*0*	*0*	*50*	*5*	*25*	*3*	*0*	*0*	*50*	*5*	*100*	*3*
3	0	0	0	0	0	0	0	0	100	5	25	4	0	0	25	5	25	3	0	0	50	5	100	3
4	50	4	0	0	0	0	0	0	0	0	25	7	0	0	75	5	0	0	0	0	0	0	100	2
5	*50*	*5*	*88*	*6*	*25*	*5*	*0*	*0*	*100*	*6*	*25*	*10*	*25*	*6*	*88*	*6*	*0*	*0*	*0*	*0*	*75*	*4*	*25*	*5*
6	50	5	75	3	25	5	0	0	100	4	0	0	25	6	75	3	0	0	0	0	75	4	25	5
7	0	0	100	9	0	0	0	0	100	8	25	10	0	0	100	8	0	0	0	0	0	0	0	0
8	*25*	*16*	*100*	*7*	*67*	*6*	*88*	*9*	*85*	*5*	*38*	*6*	*0*	*0*	*81*	*7*	*75*	*6*	*0*	*0*	*67*	*7*	*75*	*7*
9	0	0	100	7	0	0	0	0	0	0	0	0	0	0	25	8	0	0	0	0	0	0	0	0
10	0	0	0	0	25	5	0	0	100	1	0	0	0	0	100	6	0	0	0	0	25	6	100	1
11	0	0	0	0	0	0	100	1	25	7	25	5	0	0	0	0	75	6	0	0	75	7	25	8
12	0	0	100	5	75	4	0	0	100	4	50	6	0	0	0	0	0	0	0	0	0	0	100	4
13	0	0	0	0	0	0	0	0	100	3	0	0	0	0	100	4	0	0	0	0	0	0	0	0
14	25	16	100	10	100	10	75	17	100	6	0	0	0	0	100	8	0	0	0	0	100	9	75	13
15	*75*	*5*	*75*	*5*	*0*	*0*	*0*	*0*	*50*	*3*	*50*	*6*	*0*	*0*	*100*	*4*	*0*	*0*	*0*	*0*	*100*	*4*	*38*	*3*
16	75	5	75	5	0	0	0	0	50	3	50	6	0	0	100	4	0	0	0	0	100	4	50	4
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	1
18	*38*	*7*	*57*	*7*	*74*	*5*	*33*	*7*	*84*	*6*	*40*	*9*	*75*	*5*	*86*	*6*	*100*	*1*	*0*	*0*	*71*	*6*	*83*	*5*
19	0	0	0	0	0	0	25	5	100	5	0	0	0	0	100	7	0	0	0	0	0	0	0	0
20	0	0	33	15	100	6	0	0	67	9	33	9	0	0	106	13	0	0	0	0	100	8	100	13
21	0	0	0	0	0	0	0	0	----	----	0	0	0	0	25	5	0	0	0	0	----	----	25	5
22	0	0	75	4	0	0	0	0	0	0	0	0	0	0	0	0	100	1	----	----	75	3	100	3
23	0	0	25	7	100	5	0	0	100	6	0	0	0	0	100	3	0	0	0	0	50	6	100	3
24	----	----	75	7	----	----	----	----	100	6	----	----	----	----	100	4	----	----	----	----	100	6	----	----
25	----	----	----	----	----	----	----	----	50	3	----	----	----	----	25	2	----	----	----	----	----	----	----	----
26	25	11	50	10	50	6	0	0	100	5	25	8	0	0	100	7	0	0	0	0	25	7	75	6
27	0	0	0	0	0	0	0	0	100	2	75	7	0	0	100	5	0	0	0	0	75	5	100	4
28	0	0	50	7	75	2	0	0	100	6	0	0	0	0	100	6	0	0	0	0	100	7	100	1
29	75	3	75	5	100	7	50	10	75	11	25	12	0	0	130	10	0	0	0	0	75	11	75	10
30	0	0	25	3	25	3	25	5	25	4	0	0	75	5	100	4	0	0	0	0	0	0	75	4
31	0	0	100	4	0	0	0	0	100	6	0	0	0	0	0	0	0	0	0	0	50	5	0	0
32	*71*	*5*	*57*	*5*	*74*	*4*	*71*	*6*	*71*	*6*	*55*	*9*	*38*	*11*	*82*	*5*	*25*	*3*	*0*	*0*	*58*	*6*	*60*	*6*
33	0	0	100	12	100	5	0	0	100	10	75	14	25	17	100	5	0	0	0	0	100	9	0	0
34	25	6	25	5	75	5	50	5	50	4	0	0	0	0	100	5	0	0	0	0	25	2	50	4
35	100	6	0	0	0	0	0	0	100	7	0	0	0	0	100	9	0	0	0	0	100	8	100	9
36	9	0	0	0	0	0	0	0	25	4	0	0	0	0	0	0	0	0	0	0	50	5	0	0
37	0	0	100	4	0	0	100	7	100	11	0	0	0	0	100	8	0	0	0	0	100	13	33	14

	DISEASES REPORTED WHICH WERE NOT PRINTED ON THE BLANKS, AMOUNT OF SICKNESS, ETC.¶	Per cent of Weeks Present.‡	Av. Order of Prev. when Present.§
4	Ulcerative sore throat	25	4
6	Pleurisy	25	5
19	Summer sickness, with miasmatic complication, 2 weeks ending Aug. 14. Summer sickness, Aug. 21. No change, Aug. 28.		
22	Gastritis	50	4
24	Roscola	100	6
	Dropsy	75	7
29	Infantile paralysis (Aug. 7)	25	14
	Spurious hydrocephalus	25	11
35	Hysteria	25	9
38	The diarrhea seems to be confined to infants, Aug. 7.		
41	Stomatitis	25	5
43	Typhoid fever seems to be of a very grave form, Aug. 14.		
44	Asthma	33	5
45	Symptoms of influenza like hay fever, Aug. 14.		
	Hay fever (Aug. 21 and 28)	50	20
46	Hepatitis	50	5
47	Asthma	75	6
49	Typhoid fever has broken out in its old favorite locality, viz., in that portion of the town lying on the slope below cemetery. I will send you the details in a few days.—D. C. HOLLY, *Vernon. Aug. 24, 1880.*		
52	August has been an unusually healthy month in Berrien Co., all physicians say,—Aug. 28.		
55	Hay fever	25	8
57	Hay asthma	50	5
58	Gonorrhea	100	2
	Albuminuria	75	3
	Pyelitis	50	4
	Hay fever	50	3
	Metritis, dyspepsia, gastralgia, each	25	4
	Urticaria	25	3
64	Hay fever	50	4
66	Laryngitis	25	6
	Hay fever	100	4
	Increase of influenza, bronchitis, and hay		

38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	3
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	5	0	0	25	2	0	0
40	100	7	0	0	75	4	0	0	75	5	0	0	0	0	75	6	25	3	0	0	----	----	----	----
41	0	0	0	0	0	0	0	0	100	3	50	5	0	0	100	4	0	0	0	0	25	6	0	0
42	50	6	25	6	0	0	0	0	0	0	0	0	0	0	0	0	25	6	0	0	0	0	0	0
43	100	3	100	2	0	0	0	0	50	7	0	0	0	0	100	7	0	0	0	0	0	0	25	7
44	0	0	33	9	100	3	0	0	100	5	33	9	0	0	100	6	0	0	0	0	67	3	33	3
45	0	0	50	4	75	3	0	0	0	0	0	0	50	4	25	2	0	0	0	0	0	0	0	0
46	100	4	0	0	0	0	0	0	50	5	0	0	0	0	100	5	0	0	0	0	0	0	100	3
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	5	0	0	0	0	75	6	25	4
48	25	2	25	1	75	1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
49	67	5	0	0	0	0	0	0	100	5	0	0	0	0	100	4	0	0	0	0	0	0	0	0
50	0	0	0	0	25	4	0	0	25	4	0	0	0	0	25	3	0	0	0	0	25	4	0	0
51	*75*	*7*	*50*	*4*	*64*	*4*	*63*	*9*	*78*	*6*	*67*	*9*	0	0	82	7	0	0	0	0	30	4	50	2
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	4	25	1
53	0	0	50	7	100	4	0	0	100	4	50	6	0	0	100	6	0	0	0	0	50	5	0	0
54	50	11	100	3	50	4	100	9	100	10	0	0	0	0	100	11	0	0	0	0	0	0	0	0
55	100	2	0	0	75	5	0	0	100	9	75	11	0	0	100	9	0	0	0	0	0	0	----	----
56	0	0	25	4	0	0	25	8	25	5	0	0	0	0	100	4	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	6	0	0	0	0	0	0	100	3
58	0	0	25	3	50	4	0	0	75	4	0	0	0	0	25	4	0	0	0	0	25	4	25	2
59	*75*	*10*	*50*	*7*	*87*	*4*	*58*	*5*	*64*	*5*	*50*	*5*	*25*	*10*	*80*	*5*	*75*	*11*	*0*	*0*	*47*	*5*	*77*	*4*
60	0	0	0	0	0	0	0	0	0	0	50	4	0	0	50	5	0	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0	0	100	4	0	0	0	0	100	3	0	0	0	0	50	3	50	4
62	50	8	25	10	100	10	----	----	50	9	----	----	----	----	100	8	----	----	----	----	----	----	----	----
63	0	0	0	0	75	3	0	0	75	4	25	4	0	0	0	0	0	0	0	0	50	4	100	3
64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	0	0
65	0	0	0	0	0	0	0	0	75	3	0	0	0	0	75	5	0	0	0	0	0	0	0	0
66	0	0	0	0	100	1	0	0	25	2	0	0	0	0	100	3	0	0	0	0	0	0	0	0
67	100	12	100	11	100	9	0	0	100	4	0	0	25	12	100	6	50	13	0	0	50	12	0	0
68	0	0	0	0	100	3	50	4	100	4	0	0	0	0	100	4	0	0	0	0	25	1	50	4
69	0	0	100	4	100	3	0	0	100	5	50	5	0	0	50	5	0	0	0	0	----	----	0	0
70	----	----	----	----	----	----	----	----	25	6	----	----	----	----	100	4	----	----	----	----	75	5	----	----
71	0	0	75	6	100	3	100	7	0	0	100	3	0	0	25	8	0	0	0	0	50	8	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	8	0	0	0	0	100	3
73	0	0	0	0	0	0	0	0	25	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	----	----	25	4	----	----	----	----	50	3	50	1	----	----	75	4	----	----	----	----	50	3	50	3
75	0	0	0	0	0	0	0	0	50	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	0	0	0	0	75	3	25	3	25	6	0	0	0	0	25	5	0	0	0	0	0	0	0	0
77	0	0	25	10	100	4	0	0	100	7	0	0	0	0	100	8	0	0	0	0	0	0	100	9
78	0	0	50	5	0	0	0	0	100	5	25	10	25	7	100	6	0	0	0	0	0	0	0	0
79	0	0	25	2	25	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	*88*	*7*	*81*	*4*	*100*	*4*	*59*	*10*	*94*	*6*	*63*	*10*	*0*	*0*	*93*	*6*	*75*	*12*	*0*	*0*	*75*	*6*	*75*	*6*
81	100	3	75	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	4
82	100	15	0	0	100	3	0	0	100	10	100	12	0	0	100	13	100	19	0	0	100	6	100	19
83	50	6	50	4	0	0	0	0	0	0	0	0	0	0	0	0	50	4	0	0	0	6	0	0
84	0	0	100	4	100	5	50	10	75	5	0	0	0	0	100	8	0	0	0	0	75	8	50	4
85	0	0	100	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	6	0	0	0	0	0	0	0	0
87	0	0	100	5	0	0	0	0	0	0	0	0	0	0	100	7	0	0	0	0	0	0	100	3
88	0	0	100	6	0	0	0	0	100	5	25	7	0	0	100	4	0	0	0	0	100	4	0	0
89	0	0	75	5	0	0	0	0	100	3	0	0	0	0	100	2	0	0	0	0	25	5	0	0
90	100	5	50	4	0	0	0	0	0	0	0	0	0	0	50	4	0	0	0	0	0	0	25	2

fever—ragweed or no ragweed,—Aug. 7.

68 { All diseases rather mild, not increasing this week.—Aug. 14. Increase of fevers, not severe.—Aug. 21.

69 { Hepatic congestion quite frequent, Aug. 14. Great amount of hay fever of usual severity,—Aug. 21.

74	Delirium tremens	25	3
75	Asthma and hay fever	25	4
76	Jaundice	50	5

77 Continues healthy.

79 Actually no sickness here, Aug. 7.

82 { Generally healthy, 4 weeks ending Aug. 28. Bowel diseases of children subsiding; increase of throat diseases, especially the so-called diphtheria.—Aug. 14. Some increase of so-called diphtheria; saw one case of membranous croup, fatal.—Aug. 21.

85	Hay fever	25	4
89 {	Spinal meningitis	50	5
	Dyspepsia	100	1
	Malaria	100	7
	Cystitis	100	5

NOTE.—Ragweed in full blossom to-day.—HENRY B. BAKER, M. D., *Lansing, Aug. 20, 1880.*

NOTE FOR SEPTEMBER.

LINE-NUMBER 23, P. 360. The health of the city is remarkable this summer and fall; very little sickness and very few deaths. Our water used for domestic purposes is from the lake and very pure. This probably accounts for the good health of our city.—Sept. 25.

‡, § For these references, see page 327.

¶ The several numbered lines on these two pages continue statements for the localities and divisions which are named and have the same line-numbers on the two preceding pages; on the right-hand side of the page the numbers before the side-notes are the line-numbers of the localities, on pages 356-7, to which the side-notes refer.

TABLE 3—CONTINUED.—*Diseases, by Localities in Michigan,* **September**, *1880, (Five Weeks ending Saturday, October 2).*

Line Number.	Divisions and Localities Represented, and Initials of Physicians who Reported.* (Health officers in italics; those also Correspondents marked with a.*)	Reports Received.	Brain, Inflamm'n of.		Bowels, Inflamm'n of.		Bronchitis.		Cerebro-Spinal M'n'gitis.		Cholera Infantum.		Cholera Morbus.		Consumption, Pulmonary.		Croup, Membranous.		Diphtheria.		Diarrhea.		Dysentery.		Erysipelas.		Fever, Intermittent.		Fever, Remittent.	
			Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	ALL LOCALITIES.........‖	373	46	8.1	45	7.1	76	4.8	38	7.1	57	5.7	53	5.4	86	6.0	43	8.2	60	6.0	83	3.3	63	5.1	54	6.7	95	1.5	90	2.5
2	UPPER PENIN. DIV.......†	9	20	1	40	4	33	3	0	0	44	3	33	2	100	2	0	0	0	0	89	2	100	4	100	6	20	1	0	0
3	Central Mine, G. W. O.	5	20	1	40	4	20	1	0	0	20	3	20	2	0	0	0	0	0	0	80	1	0	0	0	0	20	1	0	0
4	Houghton, H. W. J......	4	0	0	0	0	50	5	0	0	75	3	50	2	100	2	0	0	0	0	100	2	100	4	100	6	0	0	0	0
5	NORTH-WESTERN DIV..†	10	20	4	20	5	80	8	20	6	60	6	40	5	20	7	0	0	60	5	90	4	60	7	40	8	100	1	100	3
6	Cadillac, *J. L.*	5	20	4	20	5	----	---	20	6	----	----	20	3	20	5	----	----	60	5	100	3	80	4	----	----	100	1	100	4
7	Manistee, *G. La. M.*......	5	0	0	0	0	80	8	0	0	60	6	60	7	20	8	0	0	0	0	80	4	40	10	40	8	100	1	100	2
8	WESTERN DIV.............†	30	20	18	40	10	80	8	0	0	64	6	47	6	100	8	20	9	75	9	87	4	93	5	40	9	100	2	96	2
9	Cedar Springs, C. S. F...	5	0	0	0	0	0	0	0	0	20	5	20	6	0	0	0	0	0	0	100	4	100	5	0	0	100	1	100	2
10	Drenthe, H. K..............	5	0	0	20	5	80	6	0	0	100	5	80	5	0	0	0	0	0	0	100	4	0	0	0	0	100	2	80	5
11	Grand Haven, *A. V.**...	5	0	0	20	10	60	6	0	0	60	4	20	4	0	0	20	9	60	8	100	4	60	5	0	0	100	2	100	2
12	Grand Rapids, A. H.....	5	0	0	0	0	0	0	0	0	0	0	40	5	100	5	0	0	100	4	60	5	0	0	20	7	100	2	100	1
13	Ludington, *A. P. McC.*	5	0	0	0	0	0	0	0	0	40	4	20	8	100	5	0	0	60	7	60	4	0	0	20	6	100	1	0	0
14	Muskegon, *O. C. W.*.....	5	20	18	80	16	100	13	0	0	100	14	100	5	100	15	0	0	80	16	100	3	100	6	80	13	100	2	100	2
15	NORTH'N CENTR'L DIV..†	10	0	0	0	0	100	5	0	0	80	7	80	6	40	8	0	0	50	3	80	3	0	0	60	5	70	1	60	2
16	Big Rapids, *I. W. B*	5	----	----	----	----	100	5	----	----	80	7	80	6	40	8	----	----	80	5	100	4	----	----	80	8	100	1	100	2
17	Roscommon, W. S. W....	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	1	60	1	0	0	40	2	40	1	40	1
18	BAY AND EASTERN DIV †	64	30	8	30	7	90	5	20	8	52	5	55	6	82	7	27	5	45	5	81	3	60	6	60	7	91	1	86	3
19	Bay City, W. R. M........	5	0	0	20	6	0	0	0	0	80	6	80	5	100	5	20	5	20	5	100	2	100	3	0	0	100	1	100	5
20	East Saginaw, *B. L. C.*	5	40	12	0	0	80	13	20	12	100	5	80	7	80	11	0	0	100	6	100	1	60	12	0	0	100	2	100	7
21	Lapeer, H. McC..........	5	----	----	----	----	80	4	0	0	20	4	0	0	0	0	0	0	0	0	100	3	40	5	0	0	100	1	100	2
22	Lexington, A. M. O......	4	0	0	0	0	25	4	0	0	25	3	50	2	0	0	0	0	25	1	25	2	0	0	0	0	25	2	25	1
23	Port Huron, *J. K. F.*....	5	0	0	20	9	100	4	0	0	26	6	80	6	100	7	0	0	0	0	100	3	100	4	100	5	100	1	100	2
24	Port Huron, A. A. W....	5	0	0	0	0	100	2	0	0	0	0	40	7	100	4	0	0	20	7	100	3	0	0	0	0	100	1	0	0
25	Port Sanilac, J. M. L....	5	----	----	----	----	40	3	20	3	0	0	0	0	20	4	40	2	0	0	40	1	0	0	0	0	40	2	0	0
26	Saginaw City, *E. A. H.*	5	0	0	0	0	20	6	0	0	20	8	20	10	100	10	0	0	60	9	80	8	0	0	0	0	100	1	80	3
27	Saginaw City, N. D. L...	5	0	0	60	7	80	5	0	0	80	5	80	6	100	5	20	7	40	3	100	3	100	6	60	7	100	1	0	0
28	Thornville, J. S. C.......	5	0	0	0	0	100	4	0	0	60	6	60	6	100	7	0	0	0	0	100	2	20	5	0	0	100	3	----	----
29	West Bay City, *A. F. H.*	5	0	0	0	0	80	7	0	0	20	5	0	0	60	9	0	0	40	8	100	5	0	0	40	10	100	1	60	3
30	West Bay City, J. W. H.	5	20	4	0	0	0	0	0	0	80	4	40	4	0	0	0	0	20	5	60	3	40	4	0	0	100	1	100	2
31	West Bay City, I. E. R.	0	0	0	20	5	0	0	0	0	60	4	20	6	60	6	0	0	80	3	40	6	20	6	40	5	100	2	100	1
32	CENTRAL DIVISION......†	72	71	9	50	7	64	5	0	0	54	6	52	5	85	6	0	0	52	7	78	2	62	4	20	4	100	1	90	3
33	Charlotte, G. B. A.......	4	100	12	100	11	100	5	0	0	75	9	75	9	100	15	0	0	75	16	100	2	50	11	0	0	100	1	100	6
34	Corunna, *J. B*............	3	33	6	0	0	100	4	0	0	33	4	67	5	0	0	0	0	67	3	67	3	100	4	0	0	100	1	100	3
35	De Witt, G. W. T........	5	0	0	0	0	100	6	0	0	80	6	60	6	100	9	0	0	0	0	100	1	80	3	0	0	100	2	100	3
36	Elsie, E. V. C.............	5	0	0	0	0	0	0	0	0	20	5	0	0	0	0	0	0	0	0	80	2	60	3	0	0	100	2	60	2
37	Hastings, A. P. D........	5	0	0	0	0	0	0	0	0	0	0	0	0	100	4	0	0	20	5	80	2	0	0	0	0	100	1	80	3
38	Howell, C. V. B..........	5	0	0	0	0	0	0	0	0	0	0	40	3	80	4	0	0	0	0	100	2	0	0	0	0	100	1	0	0
39	Hubbardston, H. W. B.	5	----	----	----	----	0	0	0	0	40	7	40	8	60	7	0	0	0	0	40	2	0	0	0	0	100	1	0	0
40	Ionia, (H. of C.) W. F. R.	5	0	0	0	0	20	5	0	0	0	0	0	0	100	4	0	0	0	0	80	1	20	2	20	4	100	2	0	0

41	Ionia, *S. V. R.*	5	0	0	0	0	0	0	0	0	40	5	60	4	100	5	0	0	0	0	100	2	100	3	0	0	100	1	100	1
42	Lansing, *J. H. W.*	5	0	0	0	0	100	6	0	0	100	4	80	4	100	5	0	0	20	7	100	3	80	4	0	0	100	1	100	1
43	Muir, L. S. S.	5	0	0	20	6	20	4	0	0	0	0	0	0	60	6	0	0	0	0	60	5	60	4	0	0	100	1	0	0
44	North Lansing, O. M.	5	0	0	40	4	40	4	0	0	0	0	20	6	100	2	0	0	0	0	80	2	60	4	0	0	100	1	80	4
45	Otisville, A. W. N.	5	0	0	0	0	100	3	0	0	0	0	0	0	100	5	0	0	100	3	60	2	0	0	0	0	100	1	100	4
46	Ovid, O. B. C.	5	0	0	0	0	20	4	0	0	40	5	0	0	20	3	0	0	40	5	40	4	20	2	0	0	0	0	100	1
47	Webberville, R. B. S.	5	0	0	0	0	60	4	0	0	0	0	40	3	0	0	0	0	0	0	80	3	0	0	20	4	100	1	80	3
48	SOUTH-WESTERN DIV.†	*34*	*0*	*0*	*33*	*10*	*73*	*6*	*0*	*0*	*50*	*5*	*42*	*6*	*94*	*6*	*0*	*0*	*67*	*6*	*82*	*5*	*38*	*7*	*78*	*9*	*100*	*2*	*97*	*2*
49	Dayton, R. H.	5	0	0	0	0	0	0	0	0	0	0	0	0	100	4	0	0	80	4	80	3	0	0	0	0	100	2	100	1
50	Mattawan, T. H. B.	4	0	0	50	8	0	0	0	0	50	5	50	3	100	6	0	0	0	0	75	2	50	6	50	6	100	3	75	3
51	Niles, S. B.	5	0	0	0	0	0	0	0	0	0	0	60	8	100	8	0	0	100	8	80	10	20	11	100	11	100	1	100	2
52	Niles, J. S. R.	5	0	0	20	12	100	9	0	0	0	0	20	12	100	5	0	0	0	0	100	7	20	12	0	0	100	1	100	3
53	Niles, *I. S.*	5	----	----	----	----	100	6	----	----	----	----	60	5	100	7	----	----	----	----	60	6	----	----	----	----	100	1	100	2
54	Otsego, M. C.	5	0	0	0	0	0	0	0	0	0	0	0	0	100	5	0	0	20	5	80	4	80	4	0	0	100	2	100	1
55	Paw Paw, J. A.	5	0	0	0	0	20	3	0	0	0	0	20	4	60	4	0	0	0	0	100	3	20	4	0	0	100	2	100	1
56	SOUTH'N-CENTRAL DIV.†	*94*	*43*	*7*	*52*	*5*	*82*	*4*	*53*	*7*	*52*	*6*	*55*	*5*	*90*	*6*	*0*	*0*	*56*	*5*	*82*	*3*	*63*	*4*	*50*	*6*	*99*	*1*	*90*	*2*
57	Adrian, *R. S.*	3	----	----	----	----	100	2	---	----	----	----	----	----	33	4	----	----	67	3	67	3	33	3	33	4	100	1	----	----
58	Albion, A. C.	5	0	0	0	0	80	4	0	0	100	3	100	4	100	3	0	0	0	0	100	2	100	3	40	4	100	1	100	2
59	Blissfield, R. B. C. N.	5	0	0	0	0	0	0	0	0	20	4	20	4	0	0	0	0	40	4	100	3	0	0	0	0	100	1	100	2
60	Brooklyn, E. N. P.	5	0	0	0	0	20	3	0	0	0	0	20	4	0	0	0	0	0	0	40	2	0	0	0	0	100	1	80	2
61	Centreville, M. S.	5	0	0	40	5	60	3	0	0	20	5	40	4	40	5	0	0	60	5	80	4	20	5	0	0	100	1	100	2
62	Clinton, A. W. A.	5	0	0	0	0	0	0	60	5	60	8	40	5	100	2	0	0	0	0	80	2	80	7	20	7	100	2	60	5
63	Coldwater, *L. A. W.*	4	50	12	75	10	100	5	75	12	75	7	75	11	100	10	0	0	50	11	100	5	100	3	100	12	100	6	100	2
64	Coldwater, L. H. W.	5	0	0	0	0	100	2	0	0	0	0	40	5	100	6	0	0	0	0	100	3	80	6	0	0	100	2	100	1
65	Hillsdale, *J. W. F.**	5	0	0	60	5	0	0	0	0	20	5	100	4	0	0	0	0	40	5	100	1	100	4	80	4	100	1	100	2
66	Hudson, A. R. S.	5	----	----	60	4	100	3	0	0	40	6	60	5	80	7	0	0	0	0	100	3	20	7	0	0	100	1	100	3
67	Jackson (Pris.), E. L. K.	5	----	----	----	---	100	1	----	----	----	----	----	----	100	3	----	----	----	----	40	4	----	----	----	----	100	2	----	---
68	Jackson, W. W.	5	0	0	0	0	100	5	0	0	0	0	0	0	100	4	0	0	0	0	40	6	0	0	0	0	100	1	100	2
69	Kalamazoo, W. B. S.	5	0	0	0	0	0	0	0	0	0	0	0	0	100	6	0	0	0	0	20	4	0	0	0	0	100	1	100	2
70	Marshall, H. L. J.	5	0	0	0	0	60	4	0	0	0	0	20	4	0	0	0	0	0	0	100	4	0	0	0	0	100	1	100	2
71	Marshall, *J. F. S.*	3	33	2	67	2	100	2	33	4	100	2	67	3	----	----	----	----	----	----	100	2	100	2	----	----	67	1	67	2
72	Mendon, H. C. C.	5	0	0	20	5	40	5	0	0	0	0	100	4	100	5	0	0	0	0	100	3	0	0	0	0	100	1	100	2
73	Mendon, E. S.	4	0	0	0	0	0	0	0	0	0	0	25	4	0	0	0	0	0	0	100	3	50	4	0	0	100	1	100	3
74	Three Rivers, C. W. B.	5	0	0	0	0	100	6	0	0	80	11	100	6	100	10	0	0	0	0	100	3	20	9	0	0	100	1	100	2
75	Union City, N. H. C.	5	0	0	0	0	100	7	40	8	60	8	20	7	100	9	0	0	80	4	100	5	100	3	0	0	100	1	0	0
76	Ypsilanti, *E. B.**	5	----	----	----	----	----	----	----	----	20	3	----	----	----	----	----	----	----	----	----	----	20	2	----	----	100	1	20	2
77	SOUTH-EASTERN DIV.†	*50*	*73*	*9*	*60*	*8*	*68*	*4*	*0*	*0*	*80*	*8*	*69*	*6*	*96*	*5*	*80*	*13*	*90*	*7*	*94*	*3*	*67*	*5*	*56*	*7*	*94*	*2*	*90*	*3*
78	Detroit (E. D.) J. B.	5	0	0	0	0	40	3	0	0	0	0	0	0	100	4	0	0	0	0	100	3	20	4	0	0	100	1	0	0
79	Detroit, W. H. R.	5	100	14	100	13	100	5	0	0	80	18	100	14	100	6	100	20	100	15	100	8	100	19	100	13	100	1	100	2
80	Milford, R. J.	5	0	0	0	0	0	0	0	0	0	0	0	0	100	3	0	0	0	0	100	3	60	3	0	0	100	1	0	0
81	Monroe, *A. I. S.*	5	0	0	100	5	80	7	0	0	80	3	100	3	100	4	0	0	100	5	100	2	100	2	0	0	100	1	100	1
82	Northville, J. M. S.	5	20	6	20	6	0	0	0	0	0	0	40	5	100	3	0	0	0	0	60	3	40	1	60	4	40	2	80	2
83	Pontiac, *W. G. E.**	5	0	0	0	0	0	0	0	0	100	5	100	3	100	8	0	0	0	0	100	1	100	4	0	0	100	2	100	6
84	Trenton, W. C.	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	4	80	6	0	0	0	0	100	2	100	1
85	Utica, G. G. R.	5	0	0	40	7	0	0	0	0	100	6	80	4	100	7	0	0	0	0	100	2	80	5	60	6	100	1	100	2
86	Washington, A. Y.	5	100	6	40	7	100	3	----	----	40	6	40	7	100	4	0	0	0	0	100	4	40	6	20	6	100	5	40	7
87	Wyandotte, E. P. C.	5	0	0	0	0	20	4	0	0	0	0	20	5	60	5	60	6	60	4	100	2	60	4	40	5	100	2	100	3

*, †, ‡, §, ‖. For these references, see footnotes on page 327.

NOTE.—Dr. H. C. Fairbank, of Flint, Mich., Oct. 5, 1880, wrote: "The month of Sept. was noted for nothing of special interest or importance in a sanitary point of view in our city, if we except for the latter part of the month an increase in the number of cases of scarlatina, which, however, have been of a mild type. Diphtheria and measles have also visited a few families, but one death only has been reported of these—the cases being, for the most part mild. One or two cases of typhoid fever and the usual number of cases of intermittent fever, have been noted. Diarrheal troubles of more or less severity have also cropped out here and there in the city, and a few cases of cholera infantum among very young children have terminated fatally. Owing to an apparent increase in the number of cases of scarlatina, special instructions have been deemed necessary to the superintendent of schools, and much valuable information in relation to this disease (taken largely from a circular issued by the State Board of Health) has been published by one of our city papers.

TABLE 3.—*Diseases, by Localities, in Michigan*, **September**, *1880, (Five Weeks ending Saturday, October 2.)*—CONTINUED.

LINE NUMBER.¶	Fever, Typhoid (Enteric.)		Fever, Typho-Malarial		Influenza.		Measles.		Neuralgia.		Pneumonia.		Puerperal Fever.		Rheumatism.		Scarlatina.		Small-pox.		Tonsillitis.		Whooping Cough.	
	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	72	6.5	72	4.8	68	4.3	31	5.8	72	4.8	48	6.1	34	6.8	79	5.1	45	7.3	0	0	62	5.7	69	4.9
2	*100*	*5*	*0*	*0*	*33*	*2*	*25*	*8*	*80*	*2*	*22*	*4*	*0*	*0*	*56*	*4*	*25*	*8*	*0*	*0*	*0*	*0*	*56*	*2*
3	0	0	0	0	20	2	0	0	80	2	20	3	0	0	80	3	0	0	0	0	0	0	20	1
4	100	5	----	----	50	2	25	8	----	----	25	5	----	----	25	5	25	8	----	----	----	----	100	2
5	*100*	*4*	*70*	*6*	*100*	*7*	*0*	*0*	*90*	*4*	*40*	*8*	*0*	*0*	*90*	*5*	*0*	*0*	*0*	*0*	*80*	*5*	*20*	*6*
6	100	4	80	6	----	----	----	----	80	4	40	5	----	----	80	4	----	----	----	----	80	5	20	6
7	0	0	60	6	100	7	0	0	100	4	40	10	0	0	100	5	0	0	0	0	0	0	0	0
8	*53*	*7*	*60*	*6*	*60*	*6*	*40*	*3*	*80*	*5*	*30*	*5*	*0*	*0*	*65*	*6*	*40*	*9*	*0*	*0*	*68*	*7*	*65*	*8*
9	40	6	100	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	80	4	0	9	0	0	40	6	60	4	0	0	40	7	100	1
11	20	8	20	8	0	0	20	1	20	9	40	5	0	0	20	6	0	0	0	0	80	7	20	10
12	0	0	20	7	20	4	60	5	100	3	20	5	0	0	0	0	20	7	0	0	40	4	100	5
13	0	0	0	0	0	0	0	0	100	2	0	0	0	0	100	3	0	0	0	0	80	6	----	----
14	100	7	100	6	100	7	0	0	100	8	0	0	0	0	100	10	40	17	0	0	100	10	40	15
15	*80*	*6*	*100*	*4*	*0*	*0*	*0*	*0*	*100*	*5*	*80*	*8*	*0*	*0*	*60*	*5*	*0*	*0*	*0*	*0*	*100*	*5*	*40*	*4*
16	80	6	100	4	----	----	----	----	100	5	80	8	----	----	60	5	----	----	----	----	100	5	40	5
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	2
18	*75*	*7*	*76*	*6*	*77*	*4*	*40*	*8*	*85*	*5*	*47*	*7*	*40*	*5*	*81*	*6*	*56*	*3*	*0*	*0*	*72*	*7*	*82*	*5*
19	0	0	40	7	0	0	0	0	100	6	0	0	0	0	100	7	0	0	0	0	20	7	0	0
20	20	12	80	8	80	5	0	0	100	8	0	0	0	0	100	13	0	0	0	0	100	14	60	13
21	0	0	0	0	20	3	0	0	20	5	0	0	0	0	40	5	0	0	0	0	----	----	100	4
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	3	75	2	0	0	25	3	100	3
23	0	0	60	6	100	3	20	7	100	4	60	6	0	0	100	3	0	0	0	0	60	6	100	4
24	0	0	80	7	0	0	0	0	80	6	20	8	0	0	100	4	0	0	0	0	40	7	0	0
25	0	0	0	0	0	0	0	0	----	----	20	3	20	2	0	0	0	0	0	0	----	----	60	1
26	100	8	80	4	80	4	0	0	100	4	60	10	0	0	100	7	0	0	0	0	80	8	100	4
27	100	6	100	6	0	0	0	0	100	3	60	6	60	7	100	4	0	0	0	0	100	5	80	6
28	0	0	100	5	100	3	0	0	100	5	0	0	0	0	100	5	0	0	0	0	100	6	100	1
29	80	3	80	4	80	5	20	9	80	7	60	9	0	0	80	8	0	0	0	0	80	10	60	9
30	0	0	80	3	0	0	0	0	100	3	0	0	0	0	20	6	0	0	0	0	0	0	60	3
31	0	0	60	6	0	0	0	0	60	4	0	0	0	0	0	0	40	4	0	0	100	5	0	0
32	*78*	*5*	*64*	*5*	*59*	*4*	*20*	*4*	*57*	*5*	*48*	*6*	*20*	*5*	*75*	*5*	*40*	*5*	*0*	*0*	*47*	*5*	*72*	*5*
33	25	16	100	12	100	4	0	0	100	8	100	14	0	0	100	5	0	0	0	0	100	9	0	0
34	67	5	33	4	0	0	0	0	0	0	33	4	0	0	33	5	0	0	0	0	33	6	67	4
35	100	5	40	7	0	0	0	0	100	7	0	0	0	0	100	8	0	0	0	0	100	9	0	0
36	0	0	80	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	4	0	0
37	0	0	40	4	0	0	0	0	0	0	0	0	0	0	20	1	0	0	0	0	0	0	100	5
38	100	3	0	0	0	0	0	0	20	4	0	0	0	0	0	0	0	0	0	0	26	3	0	0

	DISEASES REPORTED WHICH WERE NOT PRINTED ON THE BLANKS, AMOUNT OF SICKNESS, ETC.¶	Per cent of Weeks Present.‡	Av. Order of Prev. when Present.§
6	Pharyngitis	20	6
	Basilar meningitis	20	6
	Very healthy generally, Sept. 18.		
7	Pneumonia marked *typhoid*, Sept. 25.		
10	Congestive fever	20	5
16	Septicæmia	20	7
19	Summer sickness mostly, Sept. 4. Fevers continue much as usual, Sept. 11. No prevalent sickness, Sept. 18. Nothing marked, Sept. 25. Autumnal colds, with sore throats, approach; miasm everywhere, Oct. 3.		
23	See line-number 23 for September, p. 359.		
24	Dropsy	80	7
26	Dyspepsia	20	7
31	Peritonitis	20	3
40	Asthma	40	5
	Cystitis	40	4
43	Hay fever	40	2
	I am inclined to think that the bloom of the ragweed may influence these summer colds.—L. S. STEVENS, M. D., *Muir, Sept. 4, 1880.*		
46	Diphtheria in mild form, Sept. 3.		
52	German measles	20	12
	Peritonitis	20	12
54	Several cases of hay asthma, Sept. 25.		
55	Gonorrhea	100	3
	Albuminuria, asthma, each	60	4
	Pyelitis	40	5
	Gastrodynia	40	4
	Gastralgia, delirium tremens, each	20	4
	Cystitis	20	5
58	The cases that I have included under the term "typho-malarial fever" are simply a low form of malarious fever—or what I consider as such—and not genuine cases of typhoid fever modified by malarious influence.—Sept. 27.		
60	Hay fever	40	3
64	Influenza marked *hay fever*, 5 weeks ending Oct. 2.		

39	0	0	0	0	40	3	0	0	100	3	0	0	0	0	60	5	----	----	0	0	40	5	0	0
40	0	0	100	5	0	0	0	0	80	4	20	5	0	0	100	3	0	0	0	0	40	4	0	0
41	100	6	20	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	100	3	100	2	60	7	0	0	40	8	0	0	0	0	100	7	60	8	0	0	0	0	20	7
43	0	0	80	4	100	3	0	0	40	3	0	0	20	5	40	3	0	0	0	0	0	0	0	0
44	100	2	0	0	0	0	20	4	20	3	20	3	0	0	100	5	40	5	0	0	20	6	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	5	0	0	0	0	0	0	100	4
46	20	2	40	2	20	3	0	0	0	0	20	3	0	0	0	0	0	0	0	0	20	2	0	0
47	0	0	0	0	40	4	0	0	20	4	100	4	0	0	60	4	20	2	0	0	60	3	0	0
48	*90*	*9*	*100*	*4*	*93*	*6*	*80*	*4*	*62*	*5*	*30*	*6*	*0*	*0*	*86*	*6*	*0*	*0*	*0*	*0*	*60*	*6*	*80*	*3*
49	0	0	0	0	0	0	0	0	40	5	0	0	0	0	0	0	0	0	0	0	60	4	0	0
50	0	0	100	6	75	5	0	0	100	3	0	0	0	0	100	4	0	0	0	0	0	0	----	----
51	100	9	100	3	100	5	100	5	100	9	0	0	0	0	100	11	0	0	0	0	0	0	0	0
52	80	8	100	2	100	7	0	0	100	7	40	8	0	0	100	7	0	0	0	0	100	9	0	0
53	----	----	100	5	----	----	60	3	20	3	----	----	----	----	40	5	----	----	----	----	----	----	----	----
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	4	0	0	0	0	0	0	100	2
55	0	0	100	3	0	0	0	0	20	4	20	4	0	0	80	4	0	0	0	0	20	4	60	3
56	*44*	*9*	*59*	*5*	*78*	*5*	*40*	*8*	*69*	*4*	*54*	*5*	*36*	*9*	*78*	*4*	*53*	*7*	*0*	*0*	*62*	*5*	*43*	*5*
57	----	----	----	----	33	3	----	----	----	----	----	----	----	----	67	4	----	----	----	----	33	3	----	----
58	0	0	60	3	0	0	0	0	100	4	0	0	0	0	100	4	0	0	0	0	80	4	0	0
59	0	0	40	5	0	0	0	0	40	5	0	0	0	0	0	0	0	0	0	0	0	0	40	3
60	0	0	20	4	0	0	0	0	0	0	0	0	0	0	20	3	0	0	0	0	0	0	0	0
61	0	0	20	4	0	0	0	0	80	5	0	0	0	0	100	4	0	0	0	0	0	0	0	0
62	0	0	40	5	0	0	0	0	0	0	20	7	0	0	100	5	0	0	0	0	0	0	0	0
63	50	12	100	9	100	9	0	0	100	6	75	6	25	13	100	5	40	13	0	0	75	10	0	0
64	0	0	0	0	100	4	0	0	100	4	0	0	0	0	100	4	0	0	0	0	100	4	20	6
65	0	0	80	4	20	4	0	0	80	4	0	0	20	5	100	3	0	0	0	0	0	0	0	0
66	40	6	80	5	100	3	0	0	60	5	60	5	0	0	100	5	0	0	0	0	----	----	0	0
67	----	----	----	----	----	----	----	----	20	4	40	5	----	----	100	3	----	----	----	----	100	4	----	----
68	0	0	100	6	100	5	40	8	0	0	80	4	0	0	0	0	0	0	0	0	40	7	0	0
69	0	0	80	4	0	0	0	0	0	0	0	0	0	0	0	0	100	5	0	0	0	0	100	3
70	0	0	0	0	0	0	0	0	20	5	0	0	0	0	20	3	0	0	0	0	20	3	0	0
71	----	----	33	4	----	----	----	----	100	2	----	----	----	----	67	4	----	----	----	----	----	----	33	3
72	0	0	20	5	0	0	0	0	40	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	0	0	50	4	50	4	0	0	0	0	0	0	0	0	25	3	0	0	0	0	0	0	0	0
74	0	0	60	10	100	4	0	0	100	6	0	0	0	0	100	8	0	0	0	0	0	0	20	9
75	0	0	100	2	0	0	0	0	100	4	0	0	60	9	100	7	0	0	0	0	40	4	0	0
76	----	----	60	2	----	----	----	----	40	3	----	----	----	----	40	4	20	4	----	----	----	----	----	----
77	*63*	*7*	*89*	*3*	*45*	*4*	*20*	*8*	*70*	*6*	*73*	*8*	*0*	*0*	*91*	*6*	*47*	*10*	*0*	*0*	*57*	*5*	*86*	*5*
78	80	3	100	1	20	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	3	40	4
79	100	13	0	0	100	4	0	0	100	8	100	8	0	0	100	9	40	19	0	0	100	4	100	16
80	0	0	0	0	20	3	0	0	0	0	0	0	0	0	0	0	60	3	0	0	20	4	0	0
81	60	5	100	1	40	6	20	8	20	8	80	9	0	0	100	7	40		0	0	100	8	100	3
82	0	0	100	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	5
83	0	0	20	7	0	0	0	0	0	0	0	0	0	0	100	7	0	0	0	0	0	0	0	0
84	0	0	100	4	0	0	0	0	0	0	0	0	0	0	60	5	0	0	0	0	0	0	60	4
85	20	7	100	5	0	0	0	0	60	3	0	0	0	0	100	4	0	0	0	0	40	5	0	0
86	20	7	0	0	0	0	0	0	100	4	0	0	0	0	100	2	0	0	0	0	20	6	100	3
87	100	4	100	3	0	0	0	0	0	0	40	6	0	0	80	5	0	0	0	0	80	5	100	1

65	Hay fever	60	4
	Continued fever	20	4
	Malarial fever increasing, Oct. 2.		
76	Plenty of hay fever, Sept. 4. Less hay fever, more ague, Sept. 11. Hay fever abated, Sept. 25.		
72	Hog cholera	20	1
74	Continues healthy.		
79	Little sickness, not serious, Sept. 4. Healthy Sept. 25. Weather wet and cold; some increase of malarial and throat diseases and rheumatism, Oct. 2.		
82	Hay fever (Sept. 4)	20	5
	Very sickly, Sept. 18. Great change in character and amount of sickness, Sept. 25. Malarial influence strong, Oct. 2.		
85	Apoplexy	20	8
86	Spinal meningitis	20	6
	Dyspepsia	100	1
	Malaria	100	5
	Chicken-pox	20	6
	Jaundice	20	3
	Malarial jaundice	20	4
87	Two mild cases of diphtheria met with two days ago, doing well; no exposure to case past reported, nor to any known source of infection; both young boys, 6 and 8 years, in same family; sickened at same time.—Sept. 27. I have since seen one other case, a girl 18 years of age—a bad case; no known exposure; in distant neighborhood from the other cases, and no common intercommunication.—Sept. 29.		

During July, Aug., and Sept., diphtheria and typho-malarial fever prevailed severely.—E. S. RICHARDSON, M. D., *Reed City, on Sept. Meteorological Register.*

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‡, § For these references, see page 327.

¶ The several numbered lines on these two pages, 362-3, continue statements for the localities and divisions which are named and have the same line-numbers on the two preceding pages, 360-1. On the right-hand side of the page the numbers before the side-notes are the line-numbers of the localities, on pages 360-1, to which the side-notes refer.

TABLE 3.—CONTINUED.—*Diseases, by Localities in Michigan, Four Weeks ending* **October** *30, 1880.*

Line Number.	Divisions and Localities Represented, and Initials of Physicians who Reported.* (Health officers in italics; those also Correspondents marked with a.*)	Reports Received.	Brain, Inflam-mat'n of. Per cent of Weeks Present.‡	Brain, Inflam-mat'n of. Av. Order of Prevalence when Present.§	Bowels, Inflam-mat'n of. Per cent of Weeks Present.‡	Bowels, Inflam-mat'n of. Av. Order of Prevalence when Present.§	Bronchitis. Per cent of Weeks Present.‡	Bronchitis. Av. Order of Prevalence when Present.§	Cerebro-Spinal M'n'gitis. Per cent of Weeks Present.‡	Cerebro-Spinal M'n'gitis. Av. Order of Prevalence when Present.§	Cholera Infantum. Per cent of Weeks Present.‡	Cholera Infantum. Av. Order of Prevalence when Present.§	Cholera Morbus. Per cent of Weeks Present.‡	Cholera Morbus. Av. Order of Prevalence when Present.‡	Consumption, Pulmonary. Per cent of Weeks Present.§	Consumption, Pulmonary. Av. Order of Prevalence when Present.§	Croup, Membranous. Per cent of Weeks Present.‡	Croup, Membranous. Av. Order of Prevalence when Present §	Diphtheria. Per cent of Weeks Present.‡	Diphtheria. Av. Order of Prevalence when Present.§	Diarrhea. Per cent of Weeks Present.‡	Diarrhea. Av. Order of Prevalence when Present.§	Dysentery. Per cent of Weeks Present.‡	Dysentery. Av. Order of Prevalence when Present.§	Erysipelas. Per cent of Weeks Present.‡	Erysipelas. Av. Order of Prevalence when Present.§	Fever, Intermittent. Per cent of Weeks Present ‡	Fever, Intermittent. Av. Order of Prevalence when Present.§	Fever, Remittent. Per cent of Weeks Present.‡	Fever, Remittent. Av. Order of Prevalence when Present.§
1	ALL LOCALITIES........‖	294	48	6.9	47	7.5	78	4.1	35	6.6	52	5.8	47	6.4	90	5.4	43	7.0	69	5.5	69	4.3	52	5.8	55	6.4	94	1.6	90	2.5
2	UPPER-PENIN. DIV.....†	*8*	*0*	*0*	*0*	*0*	*38*	*4*	*0*	*0*	*0*	*0*	*0*	*0*	*100*	*1*	*25*	*6*	*0*	*0*	*63*	*4*	*25*	*6*	*0*	*0*	*0*	*0*	*25*	*1*
3	Central Mine, G. W. O.	4	0	0	0	0	50	2	0	0	0	0	0	0	0	0	0	0	0	0	25	3	0	0	0	0	0	0	25	1
4	Houghton, H. W. J.....	4	0	0	0	0	25	6	0	0	0	0	0	0	100	1	25	6	0	0	100	4	25	6	0	0	0	0	0	0
5	NORTH-WESTERN DIV..†	*8*	*50*	*6*	*50*	*6*	*63*	*4*	*25*	*6*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*75*	*6*	*50*	*3*	*100*	*7*	*100*	*1*	*100*	*3*
6	Cadillac, *J. L.*............	4	50	6	50	6	25	3	25	6	0	0	0	0	0	0	0	0	0	0	100	2	50	3	0	0	100	1	100	3
7	Manistee, *G. La. M.* ...	4	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	0	0	50	9	0	0	100	7	100	1	100	2
8	WESTERN DIV............†	*26*	*50*	*7*	*0*	*0*	*83*	*6*	*0*	*0*	*100*	*13*	*83*	*7*	*94*	*7*	*25*	*9*	*94*	*8*	*56*	*5*	*58*	*7*	*58*	*8*	*96*	*1*	*100*	*2*
9	Casnovia, K. and W....	2	0	0	0	0	100	5	0	0	0	0	50	5	0	0	0	0	100	5	0	0	0	0	0	0	100	1	100	3
10	Cedar Springs, C. S. F..	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	25	4	25	6	100	1	100	2
11	Drenthe, H. K...........	4	0	0	0	0	100	4	0	0	0	0	0	0	75	4	0	0	0	0	50	5	0	0	50	5	100	1	0	0
12	Grand Haven, *A. V.*..*	4	----	----	----	----	100	4	----	----	----	----	----	----	----	----	25	9	75	8	50	7	50	9	----	----	75	1	100	2
13	Grand Rapids, A. H....	4	50	7	0	0	0	0	0	0	0	0	0	0	100	6	0	0	100	4	0	0	0	0	0	0	100	2	100	1
14	Ludington, *A. P. McC.*	4	----	----	----	----	25	5	0	0	0	0	0	0	100	5	0	0	100	6	0	0	0	0	0	0	100	1	0	0
15	Muskegon, *O. C. W.*....	4	0	0	0	0	100	10	0	0	100	13	100	9	100	14	0	0	100	16	100	4	100	8	100	13	100	1	100	2
16	NORTH'N-CENTRAL DIV.†	*8*	*0*	*0*	*0*	*0*	*50*	*8*	*0*	*0*	*25*	*8*	*75*	*7*	*25*	*8*	*0*	*0*	*75*	*3*	*75*	*4*	*25*	*6*	*50*	*8*	*88*	*1*	*100*	*3*
17	Big Rapids, *I. W. B.*...	4	----	----	----	----	50	8	----	----	25	8	75	7	25	8	----	----	100	4	100	5	25	6	50	8	100	1	100	3
18	Roscommon, W. S. W...	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	2	50	2	0	0	0	0	75	1	0	0
19	BAY & EASTERN DIV...†	*52*	*33*	*8*	*25*	*9*	*79*	*5*	*25*	*8*	*25*	*3*	*50*	*7*	*92*	*6*	*50*	*7*	*61*	*5*	*75*	*4*	*25*	*6*	*50*	*7*	*88*	*1*	*97*	*3*
20	Bay City, W. R. M.......	4	0	0	0	0	50	4	0	0	0	0	0	0	100	5	75	6	100	4	100	3	25	6	0	0	100	1	100	4
21	East Saginaw, *B. L. C.*	4	50	12	25	12	100	9	25	13	0	0	75	9	100	8	0	0	100	5	100	2	0	0	0	0	100	1	100	7
22	Lapeer, H. McC.........	4	0	0	0	0	75	3	0	0	0	0	0	0	0	0	0	0	50	4	75	3	0	0	0	0	100	1	100	2
23	Lexington, A. M. O....	4	0	0	0	0	100	2	25	3	25	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	1	0	0
24	Port Huron, *J. K. F.*...	4	0	0	25	8	100	5	0	0	0	0	25	7	100	8	0	0	25	6	100	6	25	4	100	6	100	1	100	2
25	Port Huron, A. A. W. .	4	0	0	0	0	100	2	0	0	0	0	0	0	100	6	0	0	100	5	100	5	0	0	50	6	100	1	0	0
26	Port Sanilac, J. M. L....	4	----	----	----	----	----	----	25	4	----	----	----	----	100	4	25	4	----	----	25	3	----	----	----	----	75	2	----	----
27	Saginaw City, *E. A. H.*	4	0	0	0	0	75	7	0	0	0	0	0	0	100	9	0	0	25	10	50	7	0	0	25	9	100	4	100	3
28	Saginaw City, N. D. L.	4	25	7	25	7	100	4	0	0	0	0	50	6	100	4	50	7	100	4	75	4	0	0	25	7	100	1	0	0
29	Thornville, J. S. C......	4	0	0	0	0	100	5	0	0	0	0	0	0	100	7	0	0	0	0	100	3	0	0	0	0	100	2	0	0
30	West Bay City, *A. F. H.*	4	----	----	0	0	75	7	25	10	0	0	0	0	25	6	50	11	25	6	25	5	25	8	50	8	75	1	75	2
31	West Bay City, J. W. H.	4	25	4	0	0	50	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	1	100	1
32	West Bay City, I. E. R.	4	0	0	0	0	25	4	0	0	0	0	0	0	0	0	0	0	25	5	0	0	0	0	0	0	100	1	100	2
33	CENTRAL DIV............†	*55*	*100*	*12*	*29*	*7*	*74*	*3*	*0*	*0*	*42*	*6*	*33*	*6*	*91*	*5*	*50*	*5*	*74*	*6*	*60*	*3*	*44*	*6*	*36*	*4*	*92*	*2*	*74*	*3*
34	Charlotte, G. B. A......	4	100	12	25	11	100	3	0	0	50	10	50	11	100	14	0	0	75	10	100	2	0	0	0	0	100	2	100	5
35	DeWitt, G. W. T........	4	0	0	0	0	100	3	0	0	0	0	0	0	100	8	0	0	75	5	100	1	100	9	0	0	100	2	100	4
36	Elsie, E. V. C............	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	3	25	4	0	0	75	3	50	2
37	Hastings, A. P. D.......	4	0	0	0	0	0	0	0	0	0	0	0	9	100	4	0	0	50	5	0	0	0	0	0	0	100	1	100	2
38	Howell, C. V. B.........	4	0	0	0	0	0	0	0	0	0	0	0	0	100	2	0	0	0	0	25	2	0	0	0	0	50	2	0	0

39	Hubbardston, H. W. B.	4	----	----	----	----	0	0	0	0	0	0	0	0	75	8	0	0	50	8	50	4	0	0	0	0	100	1	0	0
40	Ionia (H. of C.) W. F. R.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	3	0	0	0	0	100	3	25	5	0	0	100	2	25	4
41	Ionia, *S. V. R.*	4	0	0	0	0	50	4	0	0	0	0	0	0	100	4	0	0	0	0	25	3	0	0	0	0	100	2	100	1
42	Lansing, *J. H. W.*	4	0	0	0	0	100	6	0	0	50	6	25	5	100	6	0	0	100	7	50	6	25	4	0	0	100	1	100	2
43	Muir, L. S. S.	4	0	0	0	0	50	4	0	0	0	0	0	0	25	4	50	5	0	0	0	0	0	0	50	5	100	4	0	0
44	North Lansing, O. M.	3	0	0	33	3	67	4	0	0	0	0	0	0	100	2	0	0	67	3	33	4	0	0	33	4	100	3	33	3
45	Otisville, A. W. N.	4	0	0	0	0	100	2	0	0	0	0	0	0	100	5	0	0	100	4	0	0	0	0	0	0	75	2	50	3
46	Ovid, O. B. C.	4	0	0	0	0	75	3	0	0	25	2	0	0	0	0	0	0	0	0	0	0	0	0	25	2	0	0	100	2
47	Webberville, R. B. S.	4	0	0	0	0	25	2	0	0	0	0	25	3	0	0	0	0	0	0	0	0	0	0	0	0	100	1	50	2
48	SOUTH-WESTERN DIV.†	*30*	*25*	*3*	*0*	*0*	*72*	*4*	*0*	*0*	*0*	*0*	*25*	*3*	*93*	*5*	*25*	*3*	*60*	*6*	*60*	*5*	*38*	*3*	*56*	*9*	*97*	*2*	*97*	*2*
49	Dayton, R. H.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	4	0	0	50	3	0	0	0	0	0	0	100	1	100	2
50	Mattawan, T. H. B.	2	0	0	0	0	50	3	0	0	0	0	0	0	100	4	0	0	0	0	0	0	0	0	0	0	50	3	50	2
51	Niles, S. B.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	8	0	0	100	8	25	8	0	0	100	9	100	2	100	2
52	Niles, J. S. R.	4	0	0	0	0	75	4	0	0	0	0	0	0	100	6	0	0	50	10	100	9	0	0	25	10	100	4	100	1
53	Niles, *I. S.*	4	----	----	----	----	100	5	----	----	----	----	----	----	100	6	----	----	50	6	25	5	----	----	25	9	100	1	100	2
54	Otsego, M. C.	4	0	0	0	0	50	4	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	75	6	100	2	100	2
55	Paw Paw, J. A.	4	25	3	0	0	75	3	0	0	0	0	25	3	50	3	25	3	0	0	100	2	25	3	0	0	100	2	100	2
56	St. Joseph, R. F. S.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	3	0	0	50	2	50	3	50	3	0	0	100	1	100	1
57	SOUTH'N-CENTR'L DIV.†	*67*	*38*	*4*	*50*	*6*	*88*	*4*	*67*	*5*	*50*	*5*	*44*	*5*	*84*	*5*	*25*	*6*	*52*	*3*	*71*	*4*	*71*	*5*	*53*	*5*	*99*	*7*	*92*	*3*
58	Adrian, R. S.	4	50	3	----	----	100	2	50	3	----	----	----	----	25	1	----	----	25	2	75	2	----	----	25	2	75	1	----	----
59	Albion, A. C.	4	0	0	0	0	100	4	0	0	50	5	50	5	100	3	0	0	50	5	100	4	100	4	25	5	100	1	100	2
60	Blissfield, R. B. C. N.	4	0	0	0	0	0	0	0	0	50	4	0	0	50	3	0	0	100	4	50	4	0	0	50	3	100	1	100	2
61	Brooklyn, E. N. P.	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	4	0	0	50	4	100	1	100	3
62	Centerville, M. S.	4	0	0	0	0	75	3	0	0	0	0	0	0	0	0	25	6	0	0	100	4	25	5	0	0	100	1	100	2
63	Clinton, A. W. A.	2	0	0	0	0	100	10	100	7	0	0	0	0	100	3	0	0	0	0	50	9	50	8	50	7	100	2	50	7
64	Coldwater, L. H. W.	4	0	0	75	6	100	4	0	0	0	0	0	0	100	6	0	0	0	0	25	4	0	0	100	5	100	1	100	2
65	Hillsdale, J. W. F.*	4	25	5	25	5	25	5	0	0	50	5	75	4	0	0	0	0	0	0	100	2	100	4	100	3	100	2	100	2
66	Hudson, A. R. S.	2	0	0	50	7	100	3	0	0	0	0	0	0	100	6	0	0	50	3	50	5	0	0	0	0	100	1	100	3
67	Jackson (Pris.), E. L. K.	4	----	----	----	----	100	1	----	----	----	----	----	----	100	3	----	----	----	----	75	5	----	----	----	----	100	3	----	----
68	Kalamazoo, W. B. S.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	100	1	100	2
69	Marshall, H. L. J.	4	0	0	0	0	100	2	0	0	0	0	0	0	50	6	0	0	0	0	0	0	0	0	0	0	100	4	100	5
70	Marshall, *J. F. S.*	3	0	0	0	0	100	1	0	0	0	0	0	0	0	0	0	0	33	2	33	3	0	0	0	0	100	1	0	0
71	Mendon, H. C. C.	4	0	0	0	0	100	4	0	0	0	0	25	4	100	5	0	0	0	0	50	4	0	0	0	0	100	1	100	2
72	Mendon, E. S.	4	0	0	0	0	50	2	0	0	0	0	0	0	0	0	0	0	0	0	100	2	0	0	0	0	100	1	25	3
73	Three Rivers, C. W. B.	4	0	6	0	0	100	3	0	0	0	0	25	8	100	9	0	0	0	0	100	6	0	0	25	10	100	1	100	3
74	Union City, N. H. C.	4	0	0	0	0	100	5	0	0	0	0	0	0	100	8	0	0	50	4	0	0	0	0	0	0	100	1	0	0
75	Ypsilanti, E. B.*	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	1	0	0
76	SOUTH-EASTERN DIV.†	*40*	*58*	*8*	*69*	*8*	*79*	*4*	*0*	*0*	*67*	*4*	*45*	*7*	*95*	*5*	*63*	*10*	*80*	*6*	*82*	*5*	*81*	*8*	*58*	*7*	*90*	*2*	*93*	*3*
77	Detroit (E. D.), J. B.	4	0	0	0	0	75	4	0	0	0	0	0	0	100	4	0	0	25	4	50	4	0	0	75	4	100	1	0	0
78	Detroit, W. H. R.	4	100	12	100	16	100	5	0	0	0	0	25	19	100	7	100	17	100	12	100	15	100	17	100	11	100	1	100	2
79	Milford, R. J.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	100	1	0	0
80	Monroe, *A. I. S.*	4	0	0	100	7	100	8	0	0	100	4	100	4	100	4	0	0	75	8	100	4	100	3	75	5	50	2	100	2
81	Northville, J. M. S.	4	25	6	0	0	0	0	0	0	0	0	0	0	100	4	0	0	0	0	0	0	0	0	0	0	100	3	100	2
82	Pontiac, W. G. E.*	4	0	0	0	0	75	2	0	0	0	0	25	5	100	9	0	0	0	0	100	1	100	7	0	0	100	2	75	5
83	Trenton, W. C.	4	0	0	0	0	0	0	0	0	0	0	0	0	50	6	0	0	100	3	50	6	0	0	0	0	100	2	100	1
84	Utica, G. G. R.	4	0	0	0	0	25	4	0	0	25	5	25	2	100	6	0	0	0	0	75	4	0	0	25	8	100	1	100	2
85	Washington, A. Y.	4	50	6	20	5	100	1	0	0	0	0	0	0	100	4	----	----	0	0	0	0	0	0	50	6	50	5	0	0
86	Wyandotte, E. P. C.	4	0	0	50	5	75	4	0	0	75	4	50	5	100	5	25	3	100	3	100	3	25	4	25	5	100	3	75	4

*, †, ‡, §, ‖. For these references see footnotes on page 327.

TABLE 3.—*Diseases by Localities in Michigan, Four Weeks ending Saturday,* **October** *30, 1880.*—CONTINUED.

Line Number.¶	Fever, Typhoid (Enteric.)		Fever, Typho-Malarial.		Influenza.		Measles.		Neuralgia.		Pneumonia.		Puerperal Fever.		Rheumatism.		Scarlatina.		Small-pox.		Tonsillitis.		Whooping Cough.	
	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	69	5.5	76	4.4	71	3.3	41	5.3	80	4.5	58	6.5	46	7.0	82	4.8	59	5.5	0	0	66	4.6	73	4.4
2	*75*	*3*	*25*	*4*	*100*	*2*	*100*	*3*	*88*	*4*	*38*	*5*	*0*	*0*	*88*	*5*	*25*	*4*	*0*	*0*	*50*	*6*	*25*	*1*
3	0	0	0	0	100	1	0	0	100	2	25	4	0	0	100	3	25	4	0	0	0	0	25	1
4	75	3	25	4	100	2	100	3	75	5	50	6	0	0	75	6	0	0	0	0	50	6	----	----
5	*50*	*4*	*63*	*6*	*100*	*3*	*0*	*0*	*100*	*4*	*25*	*9*	*0*	*0*	*100*	*5*	*0*	*0*	*0*	*0*	*100*	*3*	*0*	*0*
6	50	4	50	5	0	0	0	0	100	3	0	0	0	0	100	4	0	0	0	0	100	3	0	0
7	0	0	75	7	100	3	0	0	100	5	25	9	0	0	100	5	0	0	0	0	0	0	0	0
8	*63*	*10*	*93*	*5*	*71*	*5*	*75*	*5*	*88*	*4*	*50*	*8*	*60*	*6*	*73*	*6*	*63*	*9*	*0*	*0*	*94*	*5*	*80*	*3*
9	0	0	50	4	50	5	0	0	100	5	0	0	100	5	100	5	0	0	0	0	100	2	100	3
10	0	0	100	4	0	6	0	0	25	4	50	4	0	0	75	5	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	100	3	0	0	50	5	50	4	50	2	----	----	0	0	50	2
12	----	----	----	----	25	7	75	5	100	5	50	4	----	----	25	7	75	8	----	----	100	6	----	----
13	25	7	100	6	100	4	0	0	100	5	0	0	50	7	0	0	75	6	0	0	100	4	100	5
14	0	0	0	0	0	0	0	0	100	2	0	0	0	0	100	3	0	0	0	0	75	4	0	0
15	100	13	100	6	100	4	0	0	100	6	50	17	0	0	100	9	50	18	0	0	100	8	0	0
16	*75*	*5*	*100*	*4*	*0*	*0*	*25*	*5*	*75*	*4*	*50*	*8*	*0*	*0*	*50*	*5*	*0*	*0*	*0*	*0*	*63*	*4*	*50*	*7*
17	75	5	100	4	----	----	25	8	100	6	50	8	----	----	75	8	----	----	----	----	100	5	50	7
18	0	0	0	0	0	0	25	1	50	2	0	0	0	0	25	2	0	0	0	0	25	2	0	0
19	*67*	*5*	*93*	*5*	*71*	*3*	*25*	*6*	*73*	*5*	*56*	*6*	*25*	*14*	*82*	*6*	*67*	*4*	*0*	*0*	*64*	*5*	*79*	*4*
20	0	0	100	6	50	5	0	0	100	7	0	0	0	0	100	7	0	0	0	0	25	5	0	0
21	0	0	100	5	0	0	0	0	100	5	0	0	25	14	100	12	0	0	0	0	100	10	50	7
22	0	0	100	4	0	0	0	0	0	0	75	5	0	0	25	6	0	0	0	0	0	0	100	4
23	0	0	0	0	0	0	0	0	50	3	0	0	0	0	0	0	100	1	0	0	25	3	0	0
24	0	0	100	6	100	3	0	0	50	5	0	0	0	0	100	4	75	5	0	0	0	0	50	4
25	0	0	100	5	0	0	0	0	100	6	0	0	0	0	100	3	0	0	0	0	0	0	0	0
26	----	----	----	----	----	----	----	----	25	4	25	5	----	----	75	2	----	----	----	----	25	3	75	1
27	25	7	100	4	50	2	0	0	100	5	0	0	0	0	100	7	0	0	0	0	75	2	75	8
28	100	4	100	6	0	0	0	0	100	2	50	7	0	0	100	3	0	0	0	0	100	4	0	0
29	0	0	100	5	100	2	0	0	100	5	0	0	0	0	100	6	0	0	0	0	100	6	100	1
30	75	5	75	5	75	5	25	9	50	6	75	7	0	0	75	6	0	0	0	0	25	11	0	0
31	0	0	100	3	0	0	0	0	25	4	0	0	0	0	0	0	0	0	0	0	0	0	100	3
32	0	0	50	4	50	3	25	3	75	4	0	0	0	0	25	6	25	5	0	0	100	4	0	0
33	*77*	*5*	*69*	*4*	*71*	*3*	*0*	*0*	*86*	*6*	*68*	*7*	*0*	*0*	*82*	*5*	*50*	*2*	*0*	*0*	*65*	*4*	*75*	*6*
34	100	14	100	9	100	4	0	0	100	9	100	14	0	0	100	6	0	0	0	0	100	7	0	0
35	100	7	0	0	0	0	0	0	100	7	100	10	0	0	100	8	0	0	0	0	100	5	100	8
36	0	0	100	1	0	0	0	0	0	0	75	3	0	0	0	0	0	0	0	0	50	4	0	0
37	0	0	75	3	0	0	0	0	0	0	0	0	0	0	25	7	0	0	0	0	0	0	25	6

Line Number.¶	DISEASES REPORTED, WHICH WERE NOT PRINTED ON THE BLANKS, AMOUNT OF SICKNESS, ETC.¶	Per ct. of Wks. Present.‡	Av. Order of Prevalence.§
6	Pharyngitis, Oct. 9		
	Nephritis	20	3
	Metritis	20	5
	Quite healthy, except colds, Oct. 16.		
9	Stomatitis	50	5
	Malarial fever shows a tendency to cerebro-spinal irritation, Oct. 23.		
20	Diphtheria is among the most prevalent diseases; seriously troublesome cases.—Oct. 9. Fevers of a continued type.—Oct. 16. Not much sickness; throat ailments more prevalent.—Oct. 23. Sore throats of one kind and another.—Oct. 30.		
25	Dropsy	50	7
32	Peritonitis (id.)	25	4
	Hepatitis	25	4
35	Mumps	75	8
38	Typhoid fever seems to prevail in this locality; I hear that diphtheria is prevailing in the town of Iosco, with a number of deaths.—Oct. 8.		
39	Some cases said to be diphtheria, at Carson City.—Oct. 16 and 23.		
40	Pleurisy	25	4
45	Pharyngitis	50	2
55	Albuminuria	50	3
	Epilepsy	75	3
	Orchitis, diabetes, each	50	4
	Cancer of liver	25	3
	Gonorrhea	75	2
	Gastrodynia	25	3
	Asthma	25	4
	"I indicate all cases of consumption as of the usual severity, that is, they usually end in death."—Oct. 11.		
65	Continued fever	75	4
	Continued fevers more than usually severe, Oct. 9. Sickness less and lighter, Oct. 16 and 23. Very few new cases, old ones improving, Oct. 30.		
66	A number of gastric and duodenal catarrhs for the past two weeks, Oct. 19.		

38	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	2	----	----
39	0	0	50	7	75	2	0	0	100	5	0	0	0	0	75	5	0	0	0	0	75	3	0	0
40	0	0	0	0	0	0	0	0	100	4	25	4	0	0	100	2	0	0	0	0	50	4	0	0
41	25	4	0	0	50	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	100	4	100	4	50	5	0	0	100	6	0	0	0	0	100	7	0	0	0	0	75	9	0	0
43	0	0	50	5	100	1	0	0	75	3	0	0	0	0	100	3	0	0	0	0	25	3	0	0
44	100	1	33	4	0	0	0	0	0	0	33	4	0	0	100	4	0	0	0	0	0	0	0	0
45	0	0	75	5	0	0	0	0	25	6	0	0	0	0	100	5	0	0	0	0	0	0	100	4
46	25	1	25	1	50	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	4	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	2	50	2	0	0	100	2	0	0
48	*75*	*8*	*75*	*3*	*71*	*2*	*0*	*0*	*80*	*4*	*100*	*9*	*0*	*0*	*92*	*4*	*25*	*9*	*0*	*0*	*42*	*4*	*25*	*1*
49	0	0	0	0	0	0	0	0	25	4	0	0	0	0	0	0	0	0	0	0	50	3	0	0
50	0	0	0	0	50	1	0	0	100	3	0	0	0	0	100	1	0	0	0	0	50	4	0	0
51	0	0	100	4	100	3	0	0	100	6	0	0	0	0	100	6	0	0	0	0	50	5	0	0
52	75	8	75	5	100	4	0	0	100	8	100	9	0	0	100	9	0	0	0	0	100	5	0	0
53	----	----	50	4	----	----	----	----	100	4	----	----	----	----	75	6	25	9	----	----	----	----	----	----
54	0	0	0	0	0	0	0	0	100	3	0	0	0	0	100	3	0	0	0	0	0	0	0	0
55	0	0	100	2	25	1	0	0	50	3	0	0	0	0	75	3	0	0	0	0	50	3	25	1
56	0	0	50	2	0	0	0	0	75	3	0	0	0	0	100	3	0	0	0	0	0	0	0	0
57	*42*	*5*	*64*	*4*	*67*	*3*	*0*	*0*	*82*	*4*	*44*	*5*	*25*	*3*	*80*	*4*	*50*	*3*	*0*	*0*	*68*	*4*	*75*	*5*
58	----	----	50	2	----	----	----	----	----	----	----	----	25	3	75	2	----	----	----	----	----	----	----	----
59	25	4	50	3	0	0	0	0	100	4	25	5	0	0	100	3	0	0	0	0	25	5	0	0
60	25	4	75	3	0	0	0	0	25	4	0	0	0	0	0	0	0	0	0	0	25	4	0	0
61	0	0	25	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	2	0	0
62	75	6	100	4	0	0	0	0	75	5	25	6	0	0	100	4	0	0	0	0	0	0	0	0
63	0	0	50	6	0	0	0	0	50	5	100	6	0	0	50	4	100	2	0	0	0	0	0	0
64	0	0	0	0	25	5	0	0	100	4	75	5	0	0	100	4	0	0	0	0	100	2	0	0
65	0	0	75	4	0	0	0	0	100	4	25	5	0	0	100	3	0	0	0	0	0	0	0	0
66	0	0	0	0	100	4	0	0	100	4	50	5	0	0	100	5	0	0	0	0	50	4	0	0
67	----	----	----	----	----	----	----	----	----	----	----	----	----	----	100	3	----	----	----	----	100	5	----	----
68	0	0	100	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	3
69	0	0	0	0	50	1	0	0	75	5	0	0	0	0	25	4	0	0	0	0	100	3	0	0
70	0	0	0	0	0	0	0	0	100	2	33	1	0	0	100	3	0	0	0	0	100	2	0	0
71	0	0	25	6	0	0	0	0	100	4	50	4	0	0	0	0	0	0	0	0	50	5	0	0
72	0	0	0	0	0	0	0	0	25	3	0	0	0	0	50	3	0	0	0	0	0	0	0	0
73	0	0	50	9	100	4	0	0	100	5	0	0	0	0	100	7	0	0	0	0	50	9	0	0
74	0	0	100	2	0	0	0	0	100	5	0	0	0	0	100	7	0	0	0	0	100	4	50	7
75	0	0	0	0	75	2	0	0	100	3	0	0	0	0	25	3	25	3	0	0	0	0	0	0
76	*75*	*6*	*79*	*4*	*63*	*4*	*25*	*7*	*71*	*5*	*75*	*7*	*50*	*8*	*81*	*5*	*75*	*6*	*0*	*0*	*70*	*6*	*83*	*5*
77	100	3	50	2	100	4	0	0	76	4	0	0	0	0	0	0	0	0	0	0	0	0	100	3
78	100	12	0	0	100	4	0	0	100	8	100	9	0	0	100	6	0	0	0	0	100	4	100	15
79	0	0	0	0	100	2	0	0	50	4	0	0	0	0	0	0	100	3	0	0	0	0	0	0
80	100	3	100	3	75	5	25	10	25	8	75	10	50	9	50	6	100	10	0	0	100	8	100	3
81	0	0	100	2	50	1	0	0	0	0	0	0	50	6	25	6	0	0	0	0	0	0	50	5
82	0	0	75	6	25	4	0	0	75	4	75	8	0	0	100	7	0	0	0	0	25	6	----	----
83	0	0	100	4	0	0	0	0	0	0	100	6	0	0	75	5	0	0	0	0	0	0	50	4
84	25	7	75	5	25	4	0	0	75	4	25	6	0	0	100	4	0	0	0	0	75	6	0	0
85	50	6	0	0	25	4	25	3	100	4	0	0	0	0	100	2	0	0	0	0	50	6	0	0
86	75	4	50	4	0	0	0	0	0	0	75	5	0	0	100	5	25	4	0	0	0	0	100	1

71 Hog cholera very general and very fatal, Oct. 9. Some hog disease yet, Oct. 23. Pneumonia marked pleuro-pneumonia, Oct. 30.

72	Dyspepsia	25	3
73	Continues healthy.		
78	Some increase of throat troubles, Oct. 23.		
79	Mumps	50	1
81	Considerable remission in violence of disease, Oct. 23.		
84	Dyspepsia	25	1
85	Dyspepsia	100	2
	Malaria, urticaria, each	25	4
	Hematemesis	100	6
	Diabetes, mel.	25	5
	Spasmodic croup	25	5

Typhoid fever and diphtheria still prevailing.—E. S. RICHARDSON, M. D., *Reed City, on Oct. Meteorological Register.*

Considerable many cases of epizootic among horses, but generally assuming a mild form.—F. D. PARMELEE, *Hillsdale, Oct. 30. 1880.*

NOTES FOR NOVEMBER.

LINE-NUMBER 35, P. 368. Diphtheria is now prevailing here and in the country around Corunna, of quite a malignant type.—J. BAKINGTON, M. D., *Health officer, Nov. 10, 1880.*

There is quite a prevalence of sore throat in and around this place, and reported by some physicians as diphtheria. Most of the cases I have seen are follicular sore throat with slight ulceration of the tonsils.—A. G. BRUCE, M. D., *Acting Health officer, Nov. 15, 1880.*

LINE-NUMBER 14, P. 369. A form of sore throat or ulceration of the fauces and tonsils prevails as an epidemic; cases are quite severe though not fatal as yet, Nov. 20. Ulceration of the glands about the throat prevails, attacking whole families; the quacks call it diphtheria, but it is not diphtheria, Nov. 27.

LINE-NUMBER 64, P. 369. Very few new cases—light; shall soon have nothing to report.—Nov. 6. No new cases, except any amount of influenza or horse distemper, with *people* and *horses*—Nov. 13. Almost no sickness; horses have the epizootic *mildly*, people the same symptoms.—Nov. 20 and 27.

LINE-No. 74, P. 369. Very little sickness, Nov. 6. Many of our consumptives have rapidly sunk.—Nov. 27.

NINE-NUMBER 77, P. 369. Throat troubles take the lead, Nov. 13. Several cases of croup, associated with diphtheria so-called, Nov. 20. Quite a number of cases of throat diseases, Nov. 27.

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‡, §. For these references, see foot-notes on page 327.

¶ The several numbered lines on these two pages continue statements for the localities and divisions which are named and have the same line-numbers on the two preceding pages; on the right-hand side of the page the numbers before the side-notes are the line-numbers of the localities, on pages 364-5, to which the side-notes refer.

TABLE 3.—CONTINUED.—*Diseases, by Localities in Michigan, Four Weeks ending Saturday,* **November** *27, 1880.*

Line Number.	Divisions and Localities Represented, and Initials of Physicians who Reported.* (Health officers in italics; those also Correspondents marked with a*.)	Reports Received.	Brain, Inflam'n of		Bowels, Inflam'n of.		Bronchitis.		Cerebro-Spinal Men'gitis.		Cholera Infantum.		Cholera Morbus		Consumption, Pulmonary.		Croup, Membranous.		Diphtheria.		Diarrhea.		Dysentery.		Erysipelas.		Fever, Intermittent.		Fever, Remittent.	
			Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	ALL LOCALITIES.........‖	292	46	7.6	49	5.8	81	3.4	36	7.7	46	8.0	48	5.9	91	5.6	46	7.5	67	4.6	56	5.2	45	7.0	52	5.7	89	2.2	81	3.2
2	UPPER-PENIN. DIV......†	8	0	0	25	3	100	5	0	0	0	0	0	0	100	1	25	5	0	0	75	3	0	0	25	4	0	0	0	0
3	Central Mine, G. W. O.	4	0	0	25	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	3	0	0	25	4	0	0	0	0
4	Houghton, H. W. J....	4	0	0	0	0	100	5	0	0	0	0	0	0	100	1	25	5	0	0	75	3	0	0	0	0	0	0	0	0
5	NORTH-WESTERN DIV..†	7	0	0	0	0	71	5	33	9	0	0	0	0	33	7	50	4	0	0	75	4	25	4	33	7	100	1	43	3
6	Cadillac, *J. L.*.............	4	----	----	----	----	50	3	----	----	----	----	----	----	----	----	50	4	----	----	75	4	25	4	----	----	100	1	25	2
7	Manistee, *G. La. M.* ...	3	0	0	0	0	100	6	33	9	0	0	0	0	33	7	0	0	0	0	0	0	----	----	33	7	100	1	67	4
8	WESTERN DIVISION. ...†	26	0	0	100	4	81	5	0	0	25	16	75	7	94	7	56	8	81	5	58	6	63	9	63	8	88	2	85	2
9	Casnovia, K. & W.......	4	0	0	100	4	100	3	0	0	0	0	50	5	75	5	50	6	50	4	50	4	25	4	0	0	100	3	25	3
10	Cedar Springs, C. S. F..	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	5	100	1	100	2
11	Drenthe, H. K...........	2	0	0	0	0	0	0	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	100	1	0	0
12	Grand Haven, *A. V.**..	4	0	0	0	0	100	4	0	0	0	0	6	0	0	0	25	9	0	0	25	3	0	0	0	0	25	2	100	2
13	Grand Rapids, A. H. ..	4	0	0	0	0	0	0	0	0	0	0	0	0	100	6	50	7	100	4	0	0	0	0	0	0	100	3	100	2
14	Ludington, *A. P. McC.*..	4	----	----	----	----	25	5	0	0	0	0	0	0	100	6	0	0	75	5	0	0	0	0	0	0	100	1	6	0
15	Muskegon, *O. C. W.*.....	4	0	0	0	0	100	6	0	0	25	16	100	9	100	15	100	11	100	9	100	11	100	13	100	11	100	1	100	2
16	NORTH'N-CENTR'L DIV.†	8	0	0	0	0	75	6	0	0	75	7	50	7	50	7	0	0	63	4	100	6	0	0	63	4	88	1	75	3
17	Big Rapids., *I. W. B.*...	4	0	0	0	0	75	6	0	0	75	7	50	7	50	7	0	0	100	6	100	6	0	0	50	6	100	1	100	4
18	Roscommon, W. S. W..	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	2	0	0	0	0	75	2	75	1	50	2
19	BAY AND EASTERN DIV.†	50	25	10	33	6	93	4	0	0	25	10	25	10	92	7	25	12	71	5	50	6	33	11	46	7	95	2	83	4
20	Bay City, W. R. M......	4	0	0	0	0	100	2	0	0	0	0	0	0	100	5	0	0	100	4	50	6	0	0	0	0	100	1	100	6
21	East Saginaw, *B. L. C.*	4	25	13	0	0	100	6	0	0	25	11	25	13	100	11	25	71	75	7	100	5	25	16	25	12	100	1	100	7
22	Lapeer, H. McC..........	4	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	100	5	0	0	0	0	25	4	100	1	100	2
23	Lexington, A. M. O.....	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	Port Huron, *J. K. F.*...	4	0	0	0	0	100	5	0	0	0	0	0	0	100	6	0	0	25	7	0	0	0	0	100	4	100	1	100	3
25	Port Huron, A. A. W..	4	0	0	0	0	100	2	0	0	0	0	0	0	100	6	0	0	100	3	0	0	0	0	25	7	100	1	0	0
26	Port Sanilac, J. M. L...	4	----	----	----	----	50	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	Saginaw City, *E. A. H.* and *I. N. S.*...	4	0	0	25	4	100	5	0	0	25	8	0	0	100	6	0	0	75	5	25	6	0	0	25	7	100	7	50	6
28	Saginaw City, N. D. L...	4	25	6	0	0	100	4	0	0	0	0	25	6	100	4	25	6	50	2	0	0	0	0	0	0	100	1	0	0
29	Thornville, J. S. C......	4	0	0	25	7	100	4	0	0	0	0	0	0	100	7	0	0	0	0	0	0	0	0	0	0	100	3	0	0
30	West Bay City, *A. F. H.*	4	0	0	50	8	100	8	0	0	0	0	0	0	100	9	0	0	75	8	25	7	0	0	75	11	100	6	100	4
31	West Bay City, J. W. H.	4	0	0	0	0	75	3	0	0	0	0	0	0	25	5	0	0	25	5	0	0	0	0	0	0	50	1	25	1
32	West Bay City, I. E. R..	2	0	0	0	0	100	4	0	0	0	0	0	0	0	0	0	0	100	5	0	0	50	6	50	6	100	1	100	2
33	CENTRAL DIVISION.....†	54	50	7	0	0	79	3	25	8	0	0	25	2	100	6	25	6	71	4	54	5	38	7	42	5	83	3	62	3
34	Charlotte, G. B. A......	2	100	10	0	0	100	3	0	0	0	0	0	0	100	14	0	0	100	9	100	8	0	0	0	0	100	1	100	6
35	Corunna, *A. G. B.*.......	4	0	0	0	0	100	4	0	0	0	0	0	0	100	11	0	0	100	6	50	12	0	0	50	10	75	6	100	3
36	DeWitt, G. W. T.	4	0	0	0	0	100	1	0	0	0	0	0	0	100	9	0	0	100	4	100	6	25	10	0	0	100	6	25	9
37	Elsie, E. V. C............	4	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	25	4	0	0	0	0	50	3	25	2

38	Hastings, A. P. D.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	100	1	0	0
39	Hastings, *J. C. L.*	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	3	25	3	0	0	25	2	100	1	50	2
40	Hubbardston, H. W. B. and J. I. N.	4	0	0	0	0	25	1	0	0	0	0	0	0	100	5	0	0	50	4	50	2	0	0	0	0	25	1	0	0
41	Ionia, (H. of C.) W. F. R.	4	25	3	0	0	0	0	0	0	0	0	0	0	100	2	0	0	0	0	50	3	50	4	50	3	75	2	0	0
42	Ionia, *S. V. R.*	4	0	0	0	0	100	4	0	0	0	0	0	0	100	6	0	0	0	0	0	0	0	0	0	0	100	3	100	2
43	Lansing, *J. H. W.*	4	0	0	0	0	100	5	25	8	0	0	0	0	100	4	25	6	25	6	0	0	0	0	0	0	100	2	100	2
44	Muir, L. S. S.	4	0	0	0	0	100	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	3	0	0
45	Otisville, A. W. N.	4	0	0	0	0	100	1	0	0	0	0	0	0	100	3	6	0	100	2	0	0	0	0	0	0	0	0	0	0
46	Ovid, O. B. C.	4	0	0	0	0	50	4	0	0	0	0	0	0	0	0	0	0	75	2	0	0	0	0	0	0	0	0	25	2
47	Webberville, R. B. S.	4	0	0	0	0	25	2	0	0	0	0	25	2	0	0	0	0	25	3	0	0	0	0	0	0	75	1	50	3
48	SOUTH-WESTERN DIV. †	*28*	*0*	*0*	*0*	*0*	*70*	*2*	*0*	*0*	*0*	*0*	*25*	*3*	*96*	*5*	*0*	*0*	*31*	*5*	*56*	*4*	*50*	*2*	*50*	*5*	*93*	*3*	*88*	*3*
49	Dayton, R. H.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	3	0	0	50	1	25	2	0	0	25	3	100	1	100	2
50	Niles, S. B.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	7	0	0	25	11	0	0	0	0	100	5	100	4	100	3
51	Niles, J. S. R.	4	0	0	0	0	100	3	0	0	0	0	0	0	100	5	0	0	0	0	50	9	0	0	25	10	100	6	100	5
52	Niles, *I. S.*	4	----	----	----	----	100	3	----	----	----	----	----	----	100	6	----	----	25	7	----	----	----	----	50	6	100	1	100	3
53	Otsego, M. C.	4	0	0	0	0	25	2	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	50	3	100	2	25	4
54	Paw Paw, J. A.	4	0	0	0	0	25	2	0	0	0	0	25	3	75	3	0	0	0	0	100	3	50	2	0	0	100	2	0	0
55	St. Joseph, R. F. S.	4	0	0	0	0	100	1	0	0	0	0	0	0	100	3	0	0	25	2	50	3	0	0	0	0	50	2	100	2
56	SOUTH'N-CENTR'L DIV. †	*71*	*38*	*3*	*37*	*4*	*86*	*3*	*50*	*6*	*25*	*2*	*0*	*0*	*80*	*5*	*42*	*5*	*58*	*3*	*46*	*4*	*0*	*0*	*58*	*4*	*91*	*2*	*92*	*3*
57	Adrian, R. S.	4	25	3	25	4	100	2	----	----	25	2	----	----	50	2	----	----	----	----	25	3	----	----	----	----	100	2	----	----
58	Albion, A. C.	4	0	0	0	0	50	3	0	0	0	0	0	0	100	2	0	0	0	0	75	3	0	0	25	4	100	2	100	4
59	Blissfield, R. B. C. N.	4	0	0	0	0	0	0	0	0	0	0	0	0	25	3	25	3	75	2	0	0	0	0	75	3	100	1	0	0
60	Brooklyn, E. N. P.	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	3	100	2	0	0
61	Centreville, M. S.	4	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	0	0	25	4	0	0	50	6	100	1	100	3
62	Clinton, A. W. A.	4	0	0	0	0	75	3	50	6	0	0	0	0	100	3	0	0	0	0	25	4	0	0	0	0	75	2	100	4
63	Coldwater, L. H. W.	4	0	0	25	6	100	3	0	0	0	0	0	0	100	6	0	0	0	0	0	0	0	0	0	0	100	4	25	3
64	Hillsdale, *J. W. F.**	4	0	0	0	0	50	5	0	0	0	0	0	0	0	0	25	5	0	0	75	4	0	0	100	4	100	3	100	3
65	Hudson, A. R. S.	3	0	0	67	6	100	2	0	0	0	0	0	0	100	7	0	0	33	4	67	4	0	0	33	6	33	2	100	5
66	Jackson (Prls.) E. L. K.	4	----	----	----	----	100	1	----	----	----	----	----	----	100	4	----	----	----	----	----	----	----	----	50	4	100	3	----	----
67	Kalamazoo, W. B. S.	4	0	0	0	0	0	0	0	0	0	0	0	0	100	6	0	0	0	0	0	0	0	0	0	0	100	1	100	2
68	Marshall, H. L. J.	4	0	0	0	0	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	Marshall, *J. F. S.*	4	50	3	25	1	75	1	0	0	0	0	0	0	50	3	0	0	50	3	25	2	0	0	75	3	100	2	0	0
70	Mendon, H. C. C.	4	0	0	0	0	100	4	0	0	0	0	0	0	100	5	0	0	25	4	0	0	0	0	0	0	100	1	100	2
71	Mendon, E. S.	4	0	0	50	4	100	2	0	0	0	0	0	0	0	0	0	0	0	0	25	3	0	0	0	0	100	1	100	3
72	Three Rivers, C. W. B.	4	0	0	0	0	100	3	0	0	0	0	0	0	100	10	0	0	0	0	75	9	0	0	0	0	100	1	100	3
73	Union City, N. H. C.	4	0	0	0	0	100	4	0	0	0	0	0	0	100	8	75	6	100	2	0	0	0	0	0	0	100	2	0	0
74	Ypsilanti, *E. B.**	4	0	0	0	0	50	4	0	0	0	0	0	0	25	1	0	0	0	0	0	0	0	0	0	0	25	1	0	0
75	SOUTH-EASTERN DIV. †	*40*	*100*	*15*	*75*	*10*	*83*	*4*	*0*	*0*	*100*	*4*	*58*	*5*	*100*	*5*	*100*	*13*	*79*	*5*	*60*	*7*	*50*	*6*	*63*	*7*	*83*	*3*	*100*	*2*
76	Detroit (E. D.) J. B.	4	0	0	0	0	25	2	0	0	0	0	0	0	100	4	0	0	50	2	0	0	0	0	0	0	100	1	0	0
77	Detroit, W. H. R.	4	100	15	100	17	100	5	0	0	0	0	0	0	100	7	100	13	100	9	25	18	0	0	100	12	100	3	100	3
78	Milford, R. J.	4	0	0	0	0	75	2	0	0	0	0	0	0	100	4	0	0	25	4	0	0	0	0	50	5	100	1	0	0
79	Monroe, *A. I. S.*	4	0	0	100	8	100	8	0	0	100	4	100	4	100	4	0	0	100	8	100	3	100	3	0	0	100	2	100	2
80	Northville, J. M. S.	4	0	0	25	4	100	3	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0	50	4	0	0	0	0
81	Pontiac, *W. G. E.**	4	0	0	0	0	100	1	0	0	0	0	0	0	100	9	0	0	0	0	100	5	25	8	0	0	100	5	0	0
82	Trenton, W. C.	4	0	0	0	0	25	6	0	0	0	0	0	0	100	6	0	0	100	2	0	0	0	0	0	0	100	3	100	2
83	Utica, G. G. R.	4	0	0	0	0	100	4	0	0	0	0	50	6	100	6	----	----	0	0	0	0	0	0	50	6	25	2	100	3
84	Washington, A. Y.	4	0	0	0	0	100	1	0	0	0	0	0	0	100	7	----	----	0	0	25	7	25	7	0	0	75	8	0	0
85	Wyandotte, E. P. C.	4	0	0	0	0	100	3	0	0	0	0	25	4	100	4	0	0	100	2	50	4	0	0	0	0	50	3	0	0

*, †, ‡, §, ‖. For these references, see footnotes on page 327.

LINE-NUMBER 63. The "epizootic" is raging in the livery barns in this city. It commenced last week; thus far no fatal or very severe cases.—L. H. WURTZ, M. D., *Coldwater, Mich., Nov. 8, 1880.*

Relative to your inquiry, whether the horse "epizootic" in and about Coldwater seems like diphtheria in the human being, and whether more severe in the colt, analagous to diphtheria in children, would state that thus far symptoms of diphtheria are absent. The horses are first taken with a cough followed in few days by a discharge from the nostrils. The nostrils quite red and inflamed. Can discover no swelling about the neck. The animals eat well, and appear in good spirits if not worked hard. The disease is just now becoming general, and may assume a more severe type in the future. Will report to you should such be the case.—L. H. WURTZ, M. D., *Coldwater, Mich., Nov. 10, 1880.*

TABLE 3.—*Diseases, by Localities, in Michigan, Four Weeks ending Saturday,* **November** *27, 1880.*—CONTINUED.

Line Numbers.	Fever, Typhoid (Enteric.)		Fever, Typho-Malarial.		Influenza.		Measles.		Neuralgia.		Pneumonia.		Puerperal Fever.		Rheumatism.		Scarlatina.		Small-pox.		Tonsillitis.		Whooping Cough.	
	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	73	5.7	77	5.5	73	2.7	55	5.2	85	4.4	61	5.8	35	5.5	86	4.6	61	7.1	50	10.0	86	3.8	77	5.1
2	*100*	*4*	*0*	*0*	*75*	*2*	*50*	*4*	*100*	*4*	*50*	*6*	*0*	*0*	*75*	*3*	*75*	*4*	*0*	*0*	*63*	*4*	*0*	*0*
3	0	0	0	0	50	2	0	0	100	3	0	0	0	0	50	2	100	1	0	0	50	3	0	0
4	100	4	0	0	100	2	50	4	100	5	50	6	0	0	100	4	50	6	0	0	75	4	0	0
5	*25*	*4*	*67*	*6*	*57*	*4*	*0*	*0*	*100*	*3*	*43*	*6*	*0*	*0*	*100*	*3*	*0*	*0*	*0*	*0*	*50*	*3*	*0*	*0*
6	25	4	----	----	25	4	----	----	100	2	25	4	----	----	100	2	----	----	----	----	50	3	----	----
7	0	0	67	6	100	4	0	0	100	4	67	7	0	0	100	4	0	0	0	0	0	0	0	0
8	*100*	*11*	*69*	*7*	*65*	*3*	*100*	*3*	*85*	*4*	*78*	*7*	*0*	*0*	*86*	*5*	*67*	*11*	*0*	*0*	*100*	*4*	*75*	*4*
9	100	4	0	0	75	1	0	0	75	3	0	0	0	0	100	4	0	0	0	0	100	3	50	3
10	0	0	75	4	25	6	0	0	25	5	100	4	0	0	100	4	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	100	2	50	3	0	0	100	3	0	0	0	0	100	3	0	0
12	0	0	50	5	25	4	100	3	100	6	100	6	0	0	25	9	25	8	0	0	100	5	0	0
13	0	0	50	7	100	2	0	0	100	5	25	7	0	0	0	0	100	7	0	0	100	3	100	4
14	0	0	0	0	0	0	0	0	100	2	0	0	0	0	100	3	0	0	0	0	100	4	0	0
15	100	17	100	13	100	3	0	0	100	5	100	16	0	0	160	7	75	17	0	0	100	4	0	0
16	*100*	*4*	*100*	*6*	*0*	*0*	*25*	*5*	*75*	*4*	*100*	*6*	*0*	*0*	*100*	*4*	*25*	*8*	*0*	*0*	*88*	*4*	*50*	*7*
17	100	4	100	6	0	0	25	8	75	4	100	6	0	0	100	4	25	8	0	0	100	5	50	7
18	0	0	0	0	0	0	25	1	0	0	0	0	0	0	0	0	0	0	0	0	75	2	----	----
19	*42*	*4*	*84*	*5*	*76*	*3*	*50*	*6*	*78*	*5*	*55*	*6*	*38*	*6*	*93*	*5*	*55*	*6*	*0*	*0*	*83*	*5*	*75*	*5*
20	0	0	100	7	100	3	50	7	100	7	0	0	0	0	100	7	0	0	0	0	100	5	0	0
21	0	0	100	6	25	5	0	0	100	8	25	14	0	0	100	11	50	14	0	0	100	8	100	11
22	0	0	50	4	75	3	0	0	75	4	25	5	0	0	75	4	0	0	0	0	50	5	75	3
23	0	0	0	0	0	0	0	0	0	0	50	2	0	0	0	0	100	1	0	0	0	0	0	0
24	0	0	0	0	100	2	0	0	100	3	100	5	0	0	100	4	50	7	0	0	50	7	0	0
25	0	0	100	5	0	0	0	0	25	6	25	6	0	0	100	5	25	6	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	25	3	50	4	0	0	100	2	0	0	0	0	50	4	100	1
27	25	4	100	6	75	1	25	9	100	3	100	8	0	0	100	5	25	6	0	0	100	3	25	10
28	25	5	0	0	25	3	0	0	100	2	75	5	50	6	100	3	0	0	0	0	100	3	25	4
29	0	0	75	5	100	2	0	0	100	6	50	5	0	0	100	6	0	0	0	0	100	5	100	2
30	75	4	100	4	100	2	50	5	75	6	50	5	0	0	100	6	0	0	0	0	75	5	0	0
31	0	0	50	2	0	0	0	0	50	4	0	0	25	5	75	3	0	0	0	0	100	3	100	3
32	0	0	0	0	100	3	100	4	100	5	50	5	0	0	50	6	100	4	0	0	100	4	0	0
33	*91*	*6*	*83*	*5*	*71*	*3*	*0*	*0*	*88*	*4*	*77*	*6*	*25*	*11*	*83*	*5*	*60*	*8*	*0*	*0*	*85*	*3*	*83*	*7*
34	100	14	100	10	100	2	0	0	100	6	100	12	0	0	100	8	0	0	0	0	100	5	0	0
35	0	0	100	10	100	3	0	0	100	4	100	7	25	11	100	8	25	14	0	0	0	0	75	7
36	100	10	0	0	0	0	0	0	100	7	100	8	0	0	100	5	75	10	0	0	100	3	100	9
37	0	0	100	1	0	0	0	0	0	0	75	2	0	0	0	0	0	0	0	0	100	4	0	0

	DISEASES REPORTED WHICH WERE NOT PRINTED ON THE BLANKS, AMOUNT OF SICKNESS, ETC.¶	Per cent of Weeks Present.‡	Av. Order of Prev. when Present.§
4	Croup, infl.	75	4
	Diabetes, mel.	25	7
6	Healthy, Nov. 6.		
9	Chronic malarial poisoning	25	4
	Herpes, zoster	25	6
15	Four deaths from true or primary croup, week ending Nov. 27.		
17	Hemiplegia	25	6
20	Sore throats of different kinds, 4 weeks ending Nov. 27. I do not think consumption has as many victims as the last year or two.		
25	Not sickly, Nov. 27.		
28	Diphtheria in a malignant form seems to be on the increase; the horsemen say that they believe that the horse distemper prevailing is also diphtheria.—Nov. 6. Not many sick, Nov. 13.		
30	Peritonitis	25	7
	Enteritis	25	9
	Tetanus, infant	25	12
35	Follicular sore throat	25	1
	See line-number 35 (for November), p. 367.		
36	Mumps	100	4
38	Chicken-pox	75	2
39	Puerperal convulsions	25	3
41	Ulcerated sore throat	50	2
44	See line-number 44 (for November), p. 367.		
51	Bilious colic	25	11
54	Gonorrhea, dyspepsia, each	50	3
	Asthma	25	2
	Otitis	25	4
	Gastrodynia, syphilis, each	25	3
55	Almost no sickness, Nov. 27.		
58	Not much sickness, Nov. 6. Very little acute sickness, two weeks ending Nov. 27.		
62	Irritation of spine	25	5
63	See note, line-number 63, page 369.		
64	Catarrh	50	2
	See line-number 64 (for November), p. 367.		
70	Pneumonia marked pleuro-pneumonia, Nov. 6.		
71	Dyspepsia	25	3

38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	100	3	25	4	25	2	0	0	25	3	50	3	0	0	75	3	0	0	0	0	0	0	0	0
40	0	0	0	0	100	6	0	0	100	4	0	0	0	0	100	5	0	0	0	0	100	4	0	0
41	0	0	0	0	0	0	0	0	100	2	50	3	0	0	100	2	0	0	0	0	50	3	0	0
42	50	6	0	0	100	1	0	0	0	0	0	0	0	0	75	5	75	6	0	0	0	0	75	5
43	100	2	100	2	75	5	0	0	100	4	50	7	0	0	100	5	100	6	0	0	100	5	0	0
44	0	0	0	0	100	2	0	0	0	0	100	5	0	0	50	6	0	0	0	0	100	1	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	4	0	0	0	0	0	0	0	0
46	100	1	0	0	25	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	3	0	0
47	0	0	0	0	25	3	0	0	0	0	0	0	0	0	75	2	25	2	0	0	75	2	0	0
48	*25*	*10*	*58*	*8*	*81*	*2*	*0*	*0*	*83*	*5*	*75*	*6*	*0*	*0*	*86*	*4*	*0*	*0*	*0*	*0*	*75*	*3*	*50*	*2*
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	2	0	0	0	0	75	2	25	2
50	0	0	50	10	100	1	0	0	100	7	0	0	0	0	100	8	0	0	0	0	100	2	0	0
51	25	10	50	10	100	2	0	0	100	9	100	7	0	0	100	7	0	0	0	0	100	2	0	0
52	----	----	----	----	----	----	----	----	100	4	----	----	----	----	75	5	----	----	----	----	----	----	----	----
53	0	0	0	0	50	2	0	0	100	3	0	0	0	0	100	3	0	0	0	0	25	5	0	0
54	0	0	75	3	75	2	0	0	25	4	50	4	0	0	75	3	0	0	0	0	75	3	75	2
55	0	0	0	0	0	0	0	0	75	3	0	0	0	0	100	1	0	0	0	0	0	0	0	0
56	*47*	*5*	*65*	*4*	*64*	*3*	*0*	*0*	*91*	*4*	*46*	*5*	*36*	*4*	*78*	*4*	*58*	*4*	*0*	*0*	*76*	*4*	*75*	*6*
57	25	3	25	4	----	----	----	----	----	----	50	3	----	----	50	3	----	----	----	----	25	3	----	----
58	0	0	0	0	25	4	0	0	100	3	0	0	0	0	100	1	0	0	0	0	25	4	0	0
59	0	0	0	0	50	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	3	0	0
60	50	4	0	0	0	0	0	0	0	0	0	0	50	3	0	0	0	0	0	0	100	1	0	0
61	0	0	75	4	0	0	0	0	100	5	75	5	0	0	100	5	100	5	0	0	75	3	0	0
62	0	0	0	0	0	0	0	0	75	5	25	7	0	0	25	6	50	1	0	0	0	0	0	0
63	0	0	0	0	25	2	0	0	100	5	25	5	0	0	100	3	25	7	0	0	100	1	0	0
64	0	0	0	0	100	3	0	0	100	3	0	0	0	0	100	4	0	0	0	0	0	0	0	0
65	33	5	0	0	100	2	0	0	100	3	100	4	33	6	100	4	0	0	0	0	67	6	0	0
66	----	----	25	6	----	----	----	----	100	4	----	----	----	----	100	3	----	----	----	----	100	3	0	0
67	0	0	100	5	50	4	0	0	50	6	0	0	0	0	0	0	0	0	0	0	0	0	100	3
68	0	0	0	0	100	1	0	0	50	3	0	0	0	0	50	5	0	0	0	0	100	4	0	0
69	0	0	0	0	0	0	0	0	100	2	50	3	25	2	50	2	0	0	0	0	100	2	0	0
70	0	0	0	0	0	0	0	0	100	3	25	4	0	0	0	0	0	0	0	0	25	4	0	0
71	0	0	0	0	0	0	0	0	0	0	50	4	0	0	50	5	0	0	0	0	0	0	0	0
72	75	8	0	0	100	3	0	0	100	5	0	0	0	0	100	6	0	0	0	0	100	8	0	0
73	0	0	100	3	25	2	0	0	100	6	25	6	0	0	100	7	0	0	0	0	100	4	50	8
74	0	0	0	0	75	2	0	0	100	3	50	6	0	0	75	3	0	0	0	0	0	0	0	0
75	*94*	*5*	*100*	*4*	*88*	*3*	*75*	*6*	*79*	*6*	*63*	*7*	*0*	*0*	*91*	*5*	*100*	*13*	*50*	*10*	*79*	*5*	*95*	*6*
76	75	2	0	0	75	1	0	0	25	2	0	0	0	0	0	0	0	0	0	0	0	0	100	4
77	100	13	0	0	100	2	0	0	100	9	100	10	0	0	100	6	100	13	0	0	100	2	100	16
78	0	0	0	0	100	2	0	0	25	5	50	4	0	0	0	0	0	0	0	0	0	0	0	0
79	100	3	100	2	25	8	0	0	100	9	100	10	0	0	100	9	0	0	0	0	100	8	75	3
80	0	0	0	0	100	1	0	0	0	0	0	0	0	0	75	4	0	0	0	0	25	5	0	0
81	0	0	0	0	100	3	75	5	100	7	100	4	0	0	100	6	0	0	50	10	0	0	0	0
82	0	0	100	5	0	0	0	0	0	0	75	6	0	0	50	6	0	0	0	0	0	0	100	5
83	0	0	0	0	100	2	0	0	100	4	25	7	0	0	100	4	0	0	0	0	100	3	0	0
84	0	0	0	0	100	4	75	6	100	5	25	7	0	0	100	2	0	0	0	0	100	5	0	0
85	100	2	0	0	0	0	0	0	0	0	25	4	0	0	100	4	0	0	0	0	50	4	100	1

72	Pharyngitis, catarrh, each	25	7
	Continues healthy, 4 wks. ending Nov. 27.		
74	See line-number 74 (for November), p. 367.		
77	See line-number 77 (for November), p. 367.		
78	Mumps	25	1
80	Epizootic in horses, Nov. 13.		
	Sore throats (Nov. 20 and 27)	50	2
33	Dyspepsia	50	2
84	Dyspepsia	100	3
	Malaria	75	7
	Diabetes, mel., apoplexy, each	25	8
	Spasmodic croup	25	7

Whooping-cough prevails.—J. E. FAIR, *Harrisville, on Nov. Meteorological Register.*

This month we have had some influenza prevailing in this section, and epizootic among horses.—H. PETERS, M. D., *Tecumseh, Nov. '80.*

Diphtheria still prevalent in the malignant form. Horses are affected with a disease of the air-passages.—E. S. RICHARDSON, M. D., *on November Meteorological Register.*

NOTE FOR DECEMBER.

LINE-NUMBER 22, P. 372. The health of our city is remarkably good; a few very mild cases of scarlet fever; and a few cases of diphtheria, some of them quite severe, but all quieted down now. I hear that the Indians across the river, on the Canada side, have small-pox.—J. K. FARNUM, M. D., *Health officer, Port Huron, Dec. 20, 1880.*

‡, §. For these references, see page 327.

¶ The several numbered lines on these two pages continue statements for the localities and divisions which are named and have the same line-numbers on the two preceding pages. On the right-hand side of the page the numbers before the side-notes are the line-numbers of the localities on pages 368-9, to which the side-notes refer.

TABLE 3.—CONTINUED.—*Diseases, by Localities, in Michigan,* **December,** *1880. (Five Weeks ending Saturday, Jan. 1, 1881.)*

Line Number.	Divisions and Localities Represented, and Initials of Physicians who Reported.* (Health Officers in Italics; those also Correspondents marked with a*.)	Reports Received.	Brain, Inflammati'n of.		Bowels, Inflammati'n of.		Bronchitis.		Cerebro-Spinal Men'gitis.		Cholera Infantum.		Cholera Morbus.		Consumption, Pulmonary.		Croup, Membranous.		Diphtheria.		Diarrhea.		Dysentery.		Erysipelas.		Fever, Intermittent.		Fever, Remittent.	
			Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	ALL LOCALITIES‖	339	44	8.4	47	8.2	88	2.9	20	5.7	33	6.0	37	6.8	91	5.4	42	7.1	64	4.7	56	5.2	56	6.9	55	5.9	86	2.8	77	3.7
2	UPPER-PENIN. DIV.†	*10*	*0*	*0*	*0*	*0*	*100*	*4*	*0*	*0*	*0*	*0*	*0*	*0*	*60*	*2*	*0*	*0*	*0*	*0*	*50*	*4*	*0*	*0*	*60*	*8*	*0*	*0*	*50*	*5*
3	Central Mine, G. W. O.	5	0	0	0	0	0	0	0	0	0	0	6	0	20	3	0	0	0	0	40	2	0	0	0	0	0	0	20	3
4	Houghton, H. W. J.	5	0	0	0	0	100	4	0	0	0	0	0	0	100	1	----	----	0	0	60	6	0	0	60	8	0	0	80	7
5	NORTH-WESTERN DIV.†	*10*	*0*	*0*	*20*	*4*	*90*	*2*	*0*	*0*	*20*	*8*	*20*	*7*	*20*	*9*	*40*	*5*	*0*	*0*	*40*	*7*	*20*	*2*	*30*	*7*	*100*	*4*	*40*	*3*
6	Cadillac, *J. L.*	5	0	0	20	4	80	2	0	0	0	0	0	0	0	0	20	3	0	0	0	0	20	2	20	4	100	2	40	3
7	Manistee, *G. La. M.*	5	0	0	0	0	100	1	0	0	20	8	20	7	20	9	60	7	0	0	40	7	0	0	40	9	100	6	0	0
8	WESTERN DIVISION†	*25*	*0*	*0*	*80*	*16*	*100*	*4*	*0*	*0*	*0*	*0*	*60*	*14*	*75*	*9*	*60*	*13*	*88*	*6*	*100*	*10*	*100*	*12*	*75*	*7*	*85*	*2*	*100*	*3*
9	Cedar Springs, C. S. F.	5	0	0	0	0	0	0	0	0	0	0	0	0	20	9	0	0	80	5	0	0	0	0	80	4	100	1	100	2
10	Grand Haven, *A. V.**	5	0	0	0	0	100	3	0	0	0	0	0	0	0	0	20	10	100	8	0	0	0	0	40	8	0	0	100	3
11	Grand Rapids, A. H.	5	0	0	0	0	100	2	0	0	0	0	0	0	80	6	0	0	100	4	0	0	0	0	80	6	40	4	100	4
12	Ludington, *A. P. McC.*	5	----	----	----	----	100	5	0	0	0	0	0	0	100	7	0	0	60	5	0	0	0	0	0	0	100	1	0	0
13	Muskegon, *O. C. W.*	5	0	0	80	16	100	5	0	0	0	0	60	14	100	15	100	15	100	7	100	10	100	12	100	11	100	2	100	2
14	NORTH'N-CENTRAL DIV.†	*9*	*0*	*0*	*0*	*0*	*100*	*3*	*0*	*0*	*0*	*0*	*0*	*0*	*75*	*5*	*0*	*0*	*100*	*3*	*50*	*5*	*50*	*5*	*78*	*3*	*78*	*2*	*56*	*3*
15	Big Rapids, *I. W. B.*	4	----	----	----	----	100	3	---	----	----	----	----	----	75	5	----	----	100	3	50	5	50	5	100	4	100	2	75	4
16	Roscommon, W. S. W.	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	1	60	2	40	2
17	BAY AND EASTERN DIV.†	*60*	*30*	*10*	*40*	*9*	*96*	*4*	*0*	*0*	*0*	*0*	*33*	*8*	*100*	*7*	*37*	*8*	*66*	*5*	*44*	*7*	*40*	*10*	*52*	*5*	*98*	*2*	*87*	*6*
18	Bay City, W. R. M.	5	0	0	0	0	100	2	0	0	0	0	0	0	100	5	20	7	20	6	0	0	0	0	0	0	100	1	100	7
19	East Saginaw, *B. L. C.*	5	20	10	0	0	100	8	0	0	0	0	60	15	100	7	60	14	100	5	100	10	0	0	0	0	100	1	100	8
20	Lapeer, H. McC.	5	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	60	4	0	0	0	0	60	4	100	1	100	2
21	Lexington, A. M. O.	5	0	0	0	0	60	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	Port Huron, *J. K. F.*	5	0	0	0	0	100	4	0	0	0	0	0	0	100	6	0	0	100	5	0	0	0	0	60	3	100	2	100	3
23	Port Huron, A. A. W.	5	----	----	----	----	100	1	----	----	----	----	----	----	100	6	----	----	80	3	20	3	----	----	----	----	100	2	----	----
24	Port Sanilac, J. M. L.	5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	40	2	40	3	----	----	----	----	----	----	----	----	----	----
25	Saginaw City, N. D. L.	5	0	0	0	0	100	5	0	0	0	0	20	6	100	6	0	0	60	7	0	0	0	0	0	0	100	1	0	0
26	Saginaw City, *I. N. S.*	5	0	0	0	0	100	4	0	0	0	0	20	4	100	7	40	10	100	8	60	6	40	10	60	8	100	2	80	9
27	Thornville, J. S. C.	5	0	0	20	8	100	5	0	0	0	0	0	0	100	8	0	0	0	0	20	7	0	0	0	0	100	3	0	0
28	West Bay City, *A. F. H.*	5	40	10	60	9	100	6	0	0	0	0	0	0	100	7	40	9	40	8	20	10	0	0	60	8	80	3	40	5
29	West Bay City, J. W. H.	5	----	----	----	----	0	0	0	0	0	0	0	0	0	0	20	3	60	2	0	0	0	0	20	3	0	0	0	0
30	CENTRAL DIVISION†	*55*	*20*	*7*	*40*	*4*	*85*	*3*	*20*	*7*	*0*	*0*	*20*	*4*	*89*	*4*	*20*	*8*	*37*	*4*	*55*	*4*	*0*	*0*	*40*	*6*	*88*	*3*	*74*	*3*
31	DeWitt, G. W. T.	5	0	0	0	0	100	1	0	0	0	0	0	0	100	9	----	----	20	10	100	8	0	0	0	0	100	7	100	8
32	Elsie, E. V. C.	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	3	0	0	0	0	0	0	0	0	60	3
33	Hastings, A. P. D.	5	0	0	0	0	0	0	0	0	0	0	0	0	100	2	0	0	0	0	0	0	0	0	0	0	100	1	0	0
34	Hastings, *J. C. L.*	5	0	0	0	0	20	4	0	0	0	0	20	3	80	3	0	0	20	2	80	2	0	0	80	4	100	1	0	0
35	Ionia (H. of C.) W. F. R.	5	0	0	60	4	0	0	0	0	0	0	0	0	80	4	0	0	0	0	20	2	0	0	20	5	80	4	40	4
36	Ionia, *S. V. R.*	5	0	0	0	0	100	4	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	0	0	0	0	100	2
37	Lansing, *J. H. W.*	5	20	7	0	0	100	6	20	7	0	0	20	7	100	5	20	8	40	7	0	0	0	0	20	9	100	1	100	2
38	Muir, L. S. S.	5	0	0	0	0	100	5	0	0	0	0	0	0	80	5	0	0	0	0	0	0	0	0	0	0	100	4	0	0

39	Otisville, A. W. N.	5	0	0	0	0	100	1	0	0	0	0	0	0	100	3	0	0	80	2	0	0	0	0	0	0	0	0	0	0
40	Ovid, O. B. C.	5	----	----	----	----	80	3	----	----	----	----	----	----	----	----	----	----	20	3	----	----	----	----	----	----	20	3	80	2
41	Webberville, R. B. S.	5	0	0	20	4	80	2	0	0	0	0	20	3	60	3	0	0	40	4	20	3	0	0	0	0	100	2	40	2
42	SOUTH-WESTERN DIV.†	*35*	*0*	*0*	*0*	*0*	*67*	*2*	*0*	*0*	*20*	*3*	*60*	*3*	*94*	*4*	*20*	*3*	*47*	*5*	*100*	*6*	*0*	*0*	*45*	*7*	*87*	*3*	*70*	*3*
43	Dayton, R. H.	5	0	0	0	0	20	2	0	0	0	0	0	0	100	2	0	0	60	2	0	0	0	0	0	0	100	1	40	2
44	Niles, S. B.	5	0	0	0	0	----	----	0	0	0	0	0	0	100	8	0	0	0	0	0	0	0	0	100	4	100	4	100	4
45	Niles, J. S. R.	5	0	0	0	0	100	3	0	0	0	0	0	0	100	4	0	0	60	10	100	8	0	0	20	10	0	0	100	6
46	Niles, *I. S.*	5	----	----	----	----	100	1	----	----	----	----	----	----	100	6	----	----	----	----	----	----	----	----	40	7	100	2	100	3
47	Otsego, M. C.	5	0	0	0	0	40	2	0	0	0	0	0	0	100	5	0	0	0	0	0	0	0	0	20	5	80	4	0	0
48	Paw Paw, J. A.	5	0	0	0	0	20	4	0	0	20	3	60	3	60	3	20	3	0	0	100	3	0	0	0	0	80	2	60	2
49	St. Joseph, R. F. S.	5	0	0	0	0	60	1	0	0	0	0	0	0	100	2	0	0	20	2	0	0	0	0	0	0	60	2	20	3
50	SOUTH'N-CENTRAL DIV.†	*87*	*40*	*3*	*20*	*6*	*86*	*3*	*20*	*6*	*33*	*3*	*40*	*3*	*95*	*5*	*39*	*5*	*62*	*5*	*56*	*4*	*33*	*3*	*55*	*5*	*87*	*2*	*81*	*3*
51	Adrian, *R. S.*	5	----	----	20	2	80	1	----	----	----	----	----	----	----	----	----	----	----	----	40	4	----	----	----	----	80	2	----	----
52	Albion, A. C.	5	0	0	0	0	100	3	0	0	0	0	40	3	100	2	20	4	0	0	60	3	0	0	80	4	100	3	100	3
53	Blissfield, R. B. C. N.	5	0	0	0	0	0	0	0	0	0	0	0	0	40	3	0	0	40	2	0	0	0	0	0	0	100	1	40	3
54	Brooklyn, E. N. P.	5	40	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	2	0	0
55	Centerville, M. S.	4	0	0	0	0	100	1	0	0	0	0	0	0	0	0	0	0	100	5	0	0	0	0	50	6	100	2	75	3
56	Clinton, A. W. A.	5	0	0	0	0	80	6	20	6	0	[illegible]	0	0	100	4	0	0	20	5	20	7	0	0	0	0	80	4	20	4
57	Coldwater, *L. H. W.*	5	0	0	0	0	100	3	0	0	0	0	0	0	100	7	0	0	0	0	20	2	0	0	0	0	100	4	100	3
58	Hillsdale, *J. W. F.**	5	0	0	0	0	20	5	0	0	0	0	0	0	0	0	20	5	60	5	100	5	0	0	100	4	100	3	100	5
59	Hudson, A. R. S.	5	0	0	0	0	100	2	0	0	0	0	0	0	100	7	0	0	0	0	100	5	0	0	80	4	80	3	100	3
60	Jackson (Pris.) E. L. K.	5	----	----	----	----	100	1	----	----	----	----	----	----	100	3	----	----	----	----	----	----	----	----	60	6	100	4	----	----
61	Kalamazoo, W. B. S.	5	0	0	0	0	60	5	0	0	0	0	0	0	100	9	0	0	80	8	0	0	0	0	0	0	100	1	100	2
62	Marshall, H. L. J.	5	0	0	0	0	100	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	Marshall, *J. F. S.*	3	0	0	0	0	67	1	0	0	33	3	0	0	0	0	67	2	0	0	33	2	33	3	33	3	67	2	0	0
64	Mendon, H. C. C.	5	0	0	0	0	100	4	0	0	0	0	0	0	100	5	0	0	80	5	0	0	0	0	40	5	100	1	100	2
65	Mendon, E. S.	5	0	0	0	0	80	2	0	0	0	0	0	0	0	0	0	0	0	0	20	1	0	0	20	3	40	1	61	1
66	Three Rivers, C. W. B.	5	0	0	20	10	100	2	0	0	0	0	0	0	100	9	0	0	0	0	100	8	0	0	20	9	100	1	100	4
67	Union City, N. H. C.	5	0	0	0	0	100	2	0	0	0	0	0	0	100	9	60	7	100	5	0	0	0	0	0	0	100	3	0	0
68	Ypsilanti, *E. B.* *	5	0	0	0	0	0	0	0	0	0	0	0	0	100	1	0	0	20	3	0	0	0	0	0	0	0	0	0	0
69	SOUTH-EASTERN DIV.—†	*48*	*100*	*12*	*73*	*11*	*100*	*2*	*20*	*4*	*60*	*10*	*50*	*8*	*100*	*5*	*70*	*9*	*87*	*4*	*50*	*6*	*70*	*8*	*57*	*7*	*71*	*5*	*74*	*5*
70	Detroit (E. D.) J. B.	5	0	0	0	0	100	2	20	4	0	0	0	0	100	4	0	0	0	0	0	0	0	0	0	0	20	2	0	0
71	Detroit, W. H. R.	5	100	12	100	17	100	3	0	0	0	0	0	0	100	6	100	12	100	6	0	0	0	0	100	12	100	7	100	4
72	Milford, R. J.	5	0	0	0	0	100	3	0	0	0	0	0	0	100	4	0	0	80	3	0	0	0	0	0	0	100	2	0	0
73	Monroe, *A. I. S.*	5	0	0	100	9	100	4	0	0	60	10	60	10	100	4	40	6	70	7	60	10	60	10	60	7	100	8	100	8
74	Northville, J. M. S.	5	0	0	0	0	100	2	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0	20	4	40	4	0	0
75	Pontiac, *W. G. E.* *	5	0	0	0	0	100	1	0	0	0	0	0	0	100	9	0	0	0	0	0	0	0	0	60	7	100	8	0	0
76	Trenton, W. C.	3	0	0	0	0	0	0	0	0	0	0	0	0	100	8	0	0	100	1	0	0	0	0	0	0	100	3	100	2
77	Utica, G. G. R.	5	0	0	0	0	100	5	0	0	0	0	40	6	100	6	0	0	0	0	20	4	0	0	60	5	20	5	40	5
78	Washington, A. Y.	5	0	0	20	7	100	1	0	0	0	0	0	0	100	6	----	----	0	0	40	7	80	6	40	7	80	7	0	0
79	Wyandotte, E. P. C.	5	0	0	0	0	100	1	0	0	0	0	0	0	100	3	0	0	100	2	80	2	0	0	0	0	60	3	40	4

*, †, ‡, §, ‖. For these references, see footnotes on page 327.

TABLE 3.—*Diseases, by Localities, in Michigan,* **December**, *1880. (Five Weeks ending Saturday, Jan. 1, 1881).*—CONTINUED.

LINE NUMBER.¶	Fever, Typhoid (Enteric.)		Fever, Typho-Malarial.		Influenza.		Measles.		Neuralgia.		Pneumonia.		Puerperal Fever.		Rheumatism.		Scarlatina.		Small-pox.		Tonsillitis.		Whooping Cough.	
	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§	Per cent of Weeks Present.‡	Av. Order of Prevalence when Present.§
1	72	6.4	71	5.5	85	2.4	48	5.3	81	3.9	64	5.0	33	4.0	84	4.1	47	6.9	0	0	75	3.4	70	5.8
2	*80*	*5*	*0*	*0*	*100*	*1*	*20*	*1*	*90*	*3*	*50*	*6*	*0*	*0*	*100*	*4*	*80*	*5*	*0*	*0*	*70*	*3*	*0*	*0*
3	0	0	0	0	0	0	20	1	80	2	20		0	0	100	2	100	2	0	0	40	3	0	0
4	80	5	0	0	100	1	0	0	100	4	80	8	0	0	100	5	60	8	0	0	100	3	----	----
5	*0*	*0*	*0*	*0*	*100*	*3*	*20*	*8*	*100*	*3*	*50*	*5*	*0*	*0*	*90*	*2*	*0*	*0*	*0*	*0*	*70*	*3*	*40*	*2*
6	0	0	0	0	0	0	0	0	100	2	40	2	0	0	80	1	0	0	0	0	60	1	40	2
7	0	0	0	0	100	3	20	8	100	4	60	7	0	0	100	3	0	0	0	0	80	4	0	0
8	*100*	*17*	*93*	*6*	*73*	*3*	*60*	*7*	*88*	*4*	*100*	*8*	*40*	*7*	*95*	*7*	*60*	*11*	*0*	*0*	*80*	*5*	*80*	*4*
9	0	0	80	4	0	0	0	0	60	5	100	5	0	0	100	7	0	0	0	0	0	0	0	0
10	0	0	100	3	20	4	100	2	80	5	100	7	0	0	80	6	40	9	0	0	60	8	0	0
11	0	0	0	0	100	2	0	0	100	4	100	5	40	7	0	0	100	6	0	0	60	3	80	4
12	0	0	0	0	0	0	0	0	100	2	0	0	0	0	100	4	0	0	0	0	100	5	----	----
13	100	17	100	12	100	4	20	12	100	5	100	13	0	0	100	9	40	18	0	0	100	3	0	0
14	*100*	*4*	*100*	*3*	*0*	*0*	*44*	*4*	*44*	*3*	*75*	*3*	*0*	*0*	*56*	*4*	*25*	*8*	*0*	*0*	*67*	*3*	----	----
15	100	4	100	3	----	----	50	5	50	3	75	3	----	----	75	4	25	8	----	----	100	3	----	----
16	0	0	0	0	0	0	40	2	40	2	0	0	0	0	40	3	0	0	0	0	40	3	----	----
17	*50*	*9*	*77*	*8*	*86*	*3*	*48*	*6*	*86*	*5*	*51*	*6*	*20*	*1*	*93*	*5*	*43*	*6*	*0*	*0*	*78*	*4*	*57*	*7*
18	0	0	20	8	100	3	100	6	100	6	20	6	0	0	100	7	60	6	0	0	100	4	0	0
19	0	0	100	12	0	0	0	0	100	6	20	14	0	0	100	12	0	0	0	0	100	12	60	14
20	0	0	0	0	20	3	20	6	80	4	80	4	0	0	60	5	0	0	0	0	60	4	20	5
21	0	0	0	0	0	0	0	0	0	0	40	3	0	0	0	0	20	1	0	0	60	2	0	0
22	0	0	0	0	100	1	0	0	80	3	80	5	0	0	100	4	20	7	0	0	60	5	0	0
23	----	----	60	6	---	----	----	----	80	5	----	----	----	----	100	5	----	----	----	----	40	6	----	----
24	----	----	----	----	----	----	----	----	20	4	20	3	20	1	80	1	0	0	0	0	60	2	0	0
25	0	0	0	0	100	2	0	0	100	3	80	7	0	0	100	5	20	6	0	0	100	3	0	0
26	40	11	100	7	100	5	40	11	100	3	100	7	0	0	100	4	80	10	0	0	80	2	40	11
27	0	0	100	7	100	1	0	0	100	6	40	7	0	0	100	5	40	7	0	0	100	5	100	2
28	60	6	80	8	80	5	60	6	60	9	60	9	0	0	100	7	60	8	0	0	80	3	20	9
29	0	0	0	0	0	0	20	2	60	3	20	3	0	0	80	3	0	0	0	0	100	1	100	2
30	*70*	*4*	*60*	*3*	*77*	*2*	*80*	*3*	*77*	*4*	*73*	*3*	*0*	*0*	*68*	*4*	*40*	*5*	*0*	*0*	*80*	*3*	*0*	*0*
31	80	10	0	0	0	0	0	0	100	4	100	6	0	0	100	3	0	0	0	0	100	2	0	0
32	0	0	60	3	0	0	0	0	80	3	100	1	0	0	20	4	0	0	0	0	100	4	0	0
33	0	0	0	0	0	0	0	0	0	0	60	4	0	0	20	3	0	0	0	0	0	0	0	0
34	0	0	0	0	20	3	0	0	40	5	80	3	0	0	0	0	0	0	0	0	60	4	0	0
35	0	0	0	0	0	0	0	0	100	3	100	3	0	0	100	2	0	0	0	0	100	1	0	0
36	0	0	0	0	100	1	0	0	0	0	40	4	0	0	100	4	0	0	0	0	0	0	0	0
37	100	3	100	3	100	4	0	0	100	5	80	5	0	0	100	5	80	6	0	0	100	5	0	0

	DISEASES REPORTED WHICH WERE NOT PRINTED ON THE BLANKS, AMOUNT OF SICKNESS, ETC.¶	Per cent of Weeks Present.‡	Av. Order of Prev. when Present.§
4	Diabetes, mel., croup, each	40	8
6	Laryngitis	20	2
	Very healthy, Dec. 4.		
16	Pleurisy	20	2
18	Air-passages mostly affected; no epidemic, Dec. 4. But little sickness, and but little change for the last month.—Jan. 1, 1881.		
22	See line-number 22 (for December), p. 371.		
23	Dropsy	20	7
	Diphtheria present, not fatal to any great extent in the city; it seems more fatal just outside of city limits along Black River, in proximity to bottom lands.—Dec. 4. Diphtheria has been quite prevalent at Fort Gratiot village, adjoining our city at the north; quite a number of cases died.—Dec. 11.		
25	The influenza reported the people call the epizootic.—Dec. 4. There seems to be a great deal of tonsilitis in the 5th and 4th wards of this city, with many of the primary symptoms of diphtheria, but without any diphtheritic deposit to be seen.—Dec. 11. Colds accompanied with bronchitis and sore throat have been quite violent.—Jan. 1, 1881.—N. D. LEE, M. D., *Saginaw City.*		
26	Dyspepsia	20	5
	There has been an increase of sickness for the last seven days, owing, I think, to the rainy weather and higher temperature; at noon it has stood about 40° F.—Dec. 11. There seems to be a general disposition to throat diseases; atmosphere damp.—Dec. 18.		
28	Chicken-pox	20	10
	Pharyngitis	20	8
31	Spasmodic croup	40	8
	Mumps	80	5
33	Chicken-pox	40	3
35	Pleurisy	20	5

38	0	0	0	0	100	2	80	3	0	0	80	3	0	0	40	5	0	0	0	0	100	1	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	4	0	0
40	40	1	20	3	80	3	----	----	----	----	20	2	----	----	----	----	20	5	----	----	----	----	----	----
41	60	3	0	0	60	1	0	0	40	3	0	0	0	0	60	3	20	3	0	0	40	4	0	0
42	*0*	*0*	*0*	*0*	*90*	*2*	*0*	*0*	*86*	*4*	*65*	*6*	*0*	*0*	*91*	*4*	*0*	*0*	*0*	*0*	*57*	*4*	*40*	*3*
43	0	0	0	0	0	0	0	0	20	1	0	0	0	0	40	2	0	0	0	0	40	1	0	0
44	0	0	0	0	100	1	0	0	100	6	60	8	0	0	100	7	0	0	0	0	100	2	0	0
45	0	0	0	0	100	1	0	0	100	7	100	5	0	0	100	7	0	0	0	0	100	3	0	0
46	----	----	----	----	----	----	----	----	100	4	----	----	----	----	100	5	----	----	----	----	40	8	----	----
47	0	0	0	0	100	1	0	0	100	3	20	7	0	0	100	3	0	0	0	0	40	7	0	0
48	0	0	0	0	60	3	0	0	80	3	0	0	0	0	100	3	0	0	0	0	20	1	40	3
49	0	0	0	0	0	0	0	0	100	2	80	3	0	0	100	1	0	0	0	0	0	0	0	0
50	*40*	*6*	*50*	*4*	*78*	*2*	*0*	*0*	*78*	*4*	*55*	*4*	*40*	*4*	*77*	*3*	*48*	*6*	*0*	*0*	*75*	*3*	*87*	*7*
51	----	----	40	4	80	2	----	----	----	----	20	2	0	0	20	2	60	2	----	----	40	2	----	----
52	0	0	0	0	0	0	0	0	100	3	40	3	0	0	100	2	0	0	0	0	0	0	0	0
53	0	0	0	0	20	2	0	0	80	3	40	3	0	0	20	3	0	0	0	0	0	0	0	0
54	40	4	20	2	0	0	0	0	0	0	40	2	40	4	100	2	0	0	0	0	60	1	0	0
55	0	0	75	6	0	0	0	0	50	4	50	6	0	0	100	6	25	6	0	0	100	3	0	0
56	0	0	0	0	80	3	0	0	40	2	60	5	0	0	20	1	80	1	0	0	0	0	0	0
57	0	0	0	0	60	3	0	0	100	5	100	6	0	0	100	4	80	7	0	0	100	1	80	7
58	0	0	0	0	100	3	0	0	100	3	20	5	0	0	100	3	0	0	0	0	20	4	0	0
59	20	4	60	5	100	2	0	0	100	4	100	4	0	0	100	4	0	0	0	0	100	3	0	0
60	----	----	----	----	----	----	----	----	60	5	----	----	----	----	100	4	----	----	----	----	100	2	----	----
61	0	0	20	7	100	3	0	0	100	5	40	7	0	0	0	0	20	9	0	0	100	4	80	7
62	0	0	0	0	40	1	0	0	60	4	0	0	0	0	60	3	0	0	0	0	100	2	0	0
63	0	0	0	0	0	0	0	0	100	1	67	2	0	0	100	2	0	0	0	0	100	2	0	0
64	0	0	0	0	0	0	0	0	100	3	0	0	0	0	0	0	0	0	0	0	20	4	0	0
65	0	0	40	2	0	0	0	0	40	2	0	0	0	0	60	2	0	0	0	0	20	1	0	0
66	60	9	0	0	100	4	0	0	100	4	40	6	0	0	100	5	20	11	0	0	100	8	0	0
67	0	0	100	4	100	1	0	0	100	6	100	5	0	0	100	7	0	0	0	0	100	2	100	6
68	0	0	0	0	80	3	0	0	20	2	0	0	0	0	60	2	0	0	0	0	0	0	0	0
69	*91*	*6*	*100*	*6*	*100*	*2*	*60*	*5*	*89*	*5*	*74*	*5*	*0*	*0*	*88*	*4*	*35*	*9*	*0*	*0*	*83*	*3*	*82*	*5*
70	60	3	0	0	100	1	0	0	100	2	40	3	0	0	0	0	0	0	0	0	40	4	20	4
71	100	14	0	0	100	1	0	0	100	9	100	8	0	0	100	8	40	15	0	0	100	2	100	16
72	0	0	0	0	100	2	0	0	20	6	0	0	0	0	40	5	0	0	0	0	0	0	0	0
73	100	7	100	8	100	5	0	0	100	2	100	3	0	0	100	3	20	7	0	0	100	2	80	3
74	0	0	0	0	100	1	0	0	0	0	0	0	0	0	80	4	20	5	0	0	20	5	0	0
75	0	0	0	0	100	3	60	5	100	7	100	3	0	0	100	3	0	0	0	0	100	5	0	0
76	100	6	100	4	0	0	0	0	0	0	0	0	0	0	67	7	0	0	0	0	0	0	100	5
77	0	0	0	0	100	1	0	0	100	3	40	6	0	0	100	4	0	0	0	0	100	3	80	5
78	0	0	0	0	100	2	0	0	100	5	60	7	0	0	100	3	60	7	0	0	100	4	100	3
79	100	2	0	0	0	0	0	0	0	0	80	3	0	0	100	3	0	0	0	0	100	3	100	2

38 This epidemic of sore throat has prevailed several weeks.—Dec. 4.

39 No sickness; some colds with increase of dampness.—Dec. 4.

48

Syphilis	60	3
Gonorrhea	100	1
Asthma, otorrhea, strangury, dysmenorrhea, albuminuria, each	20	3
Peritonitis	20	4
Stomatitis	40	3

49 Increase in pulmonary troubles.—Dec. 4.

58 See line-number 58, below.

66

Catarrh	70	7
Continues healthy, 4 weeks ending Jan. 1, 1882.		

68

Sore throat (Jan. 1, 1881)	20	2

It is remarkable the number of cases that have proved fatal from pulmonary consumption within the past few weeks. The sudden change of temperature seems too trying for them, and many new cases appear to develop themselves in susceptible constitutions. A rapid breaking down of lung tissue seems to be the chief cause of death; cases seem to expectorate their lives away; many cases of what may be termed *sthenic hemoptysis* have come under my care, seeming to debilitate and run down the patient rapidly.—*Ypsilanti, Dec. 6.*

71 Sore throats somewhat prevalent, otherwise healthy.—Dec. 4. Healthy.—Dec. 11. Healthy; throat troubles rather common.—Dec. 18. Healthy; cold and cloudy, have not seen the sun this week.—Dec. 25.

74	Sore throat	60	2
	Spasmodic croup	40	6
	Dyspepsia	100	3
	Malaria	60	7
	Herpes zoster	60	6
	Chicken-pox	20	8

78 Whooping-cough prevails now; and in fact all coughs (which are now very prevalent) both in adults and children are of a marked spasmodic character.—ALBERT YATES, M. D., *Washington, Mich., Dec. 1, 1880.*

Diphtheria prevails in a malignant form in the country surrounding this village; no cases occurring in the village for three weeks.—E. S. RICHARDSON, M. D., *Reed City, on Dec., 1880, Meteorological Register.*

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‡, §. For these references, see foot-notes on page 327.

¶ The several numbered lines on these two pages continue statements for the localities and divisions which are named and have the same line-numbers on the two preceding pages; on the right-hand side of the page the numbers before the side-notes are the line-numbers of the localities, on pages 372-3, to which the side-notes refer.

LINE-NUMBER 58. Catarrhal fever, or epizootic; very little sickness except bad colds and catarrhs.—Dec. 4. Catarrhal fevers nearly gone, also epizootic in horses—appear the same.—Dec. 11. Have not reported a case of pneumonia since last spring; thought I must inquire among all our doctors, but could not raise a case.—Dec. 18.

DISEASES WHICH CAUSE MOST SICKNESS.

When people come to know how much sickness there is from certain diseases, and how little sickness there is and how few deaths occur from certain other diseases, they will more thoroughly carry out measures for the prevention of sickness and deaths from those diseases which are found to be of most consequence. That there is much sickness in the State is evident from the fact that so many physicians flourish. The attempt has been made to learn from this compilation what are the diseases which caused most sickness during the year 1880. The results of the study, and the principal items of the evidence, are presented in Exhibit 10, page 377. According to the evidence there given, which is believed to be the best attainable, intermittent fever, commonly called ague, was the most prevalent disease in 1880. It was reported present on 80 per cent of the weekly reports received for that year, and its average order of prevalence was 2.3 (the diseases being numbered on the card-reports, in order of greatest prevalence, that of which there were the most cases being numbered 1.) This means that more than eight out of ten of the cards received for the year stated intermittent fever to be present, under the observation of the physicians making the reports; and that it was so often reported *first* or *second* in order of prevalence, or as one of the most prevalent diseases, that its average rank for the year and for all localities at which it was reported present is 2.3. No other disease averages higher than 3.3 in order of prevalence. By this is indicated the great importance of measures to learn the cause or causes of intermittent fever, and of measures for its prevention by the removal or avoidance of those causes.

In Diagram 3 is graphically represented by months the course of intermittent fever in 1880, as indicated for each month by the per cent which the reports which stated the disease to be present was of all reports received. In Exhibit 23 is a study by months, of relations of intermittent fever to certain meteorological conditions. The great reported prevalence of intermittent fever in the State suggests the question whether all the sickness reported as such is truly intermittent fever; or whether a "bilious" or continued fever preceded often by a chill but lacking the recurrence at regular intervals characteristic of true intermittent fever, be not sometimes reported as intermittent fever. It is much to be desired that observers should carefully discriminate between diseases reported, not reporting other diseases under the name of those printed on the blanks, but writing their real names at the bottom of the card. It is quite possible that physicians in Michigan report as "intermittent fever" many cases of sickness which in almost any eastern State would be reported under some other name.

The disease which, next to intermittent fever, seems to have caused most sickness in 1880 is rheumatism. Next to this (naming them in order of their apparent prevalence in 1880, those most prevalent first) were bronchitis, neuralgia, remittent fever, pulmonary consumption, influenza, diarrhea, tonsilitis, and pneumonia. These each seem to have caused more sickness than the average from the 26 diseases tabulated in this compilation. The most prevalent of those ranking below the average seem to have been whooping-cough, diphtheria, typho-malarial fever, measles, and cholera-morbus.

Scarlet fever was reported on 23 per cent of the reports received for 1879, and its average order of prevalence was 5.5. For 1880 it was reported on but 15 per cent of the reports, and its average order of prevalence fell to 6.5. So great an apparent decrease of prevalence of so prominent and destructive a disease is worthy of notice, and of comparison with statistics of deaths for those years. The returns of deaths made by the supervisors, to the State Department, show a decrease in 1880 of 48 deaths, compared with deaths from scarlet fever in 1879, the deaths in 1879 being 418, and in 1880 only 370.

The area of prevalence of sickness reported from diphtheria seems to have been slightly less in 1880 than in 1879; but the returns of deaths show that they were greatly increased in 1880, there being reported 1,473 deaths from diphtheria in 1879, and 1,542 in 1880.

EXHIBIT 10.—*Diseases from which there seems to have been the Most Sickness in Michigan in 1880, as indicated by the Per Cent of Weekly Reports stating Presence of the Diseases, as studied in connection with the Average Order of Prevalence of said Diseases when reported present; also Per Cent of Reports and Average Order for the Same Diseases in 1879.*

	1880.				1879.		
	ORDER.*	DISEASES IN ORDER OF APPARENT SICKNESS IN 1880, MOST PREVALENT ONE FIRST.	Per Cent of Reports Stating Presence of. *d*	Av. Order of Prevalence when Present. *e*	ORDER.*	Per Cent of Reports Stating Presence of. *d*	Av. Order of Prevalence when Present. *e*
More sickness than average for 26 diseases, in 1880.	1	Intermittent fever	82	2.3	1	82	2.2
	2	Rheumatism	71	4.6	2	72	4.6
	3	Bronchitis	64	3.7	3	64	3.6
	4	Neuralgia	64	4.5	7	59	4.5
	5	Remittent fever	56	3.3	4	57	3.3
	6	Consumption, pulmonary	68	5.7	6	70	5.6
	7	Influenza	42	3.0	5	45	3.1
	8	Diarrhea	47	4.2	8	48	4.4
	9	Tonsilitis	49	4.4	9	45	4.5
	10	Pneumonia	42	5.1	10	41	5.2
		Average of 26 diseases	32	4.7	....	33	4.7
Less than said average.	11	Whooping-cough	32	4.8	13	23	5.5
	12	Diphtheria	27	5.7	11	29	5.4
	13	Typho-malarial fever	24	5.5	14	22	5.8
	14	Measles	19	4.8	....	12	4.7
	15	Cholera morbus	20	5.3	....	19	5.3

* Judging from the per cent of reports which stated presence of the diseases, in connection with the order of prevalence when prevalent. It is possible that the estimates of order for the two years, 1879 and 1880, may not be entirely consistent. They are presented only as estimates, and for 1879 are left as made a year ago.

d, *e* See foot-notes with these marks on page 315. The greatest relative prevalence was marked 1 on the card-reports.

Remarks on Exhibit 10 are printed on pages 310 and 376. An idea of the comparative prevalence of diseases may also be obtained by an examination of Diagrams 1, p. 308, and Diagrams 2, 3, and 4, on following pages; the diagrams being accurately drawn to scale, the distance from the bottom of the diagram to the line representing the disease indicates the prevalence of the disease in each month, the per cent of all reports received which state that disease to be present being found by referring to the column at the left of the diagram.

EXHIBIT 11.—*By Six (of eleven) Geographical Divisions[*] of the State, the Diseases from which there seems to have been the Greatest Amount of Sickness in 1880, as indicated by the Per Cent of Weekly Reports stating Presence of each of 26 Leading Diseases when studied in connection with the Average Order of Prevalence of said Diseases when reported present.*

	Order.[†]	Diseases in order of apparent amount of sickness, most prevalent one first.	Per Cent of Reports Stating Presence of.[d]	Av. Order of Prevalence where Present.[e]	Diseases in order of apparent amount of sickness, most prevalent one first.	Per Cent of Reports Stating Presence of.[d]	Av. Order of Prevalence where Present.[e]	Diseases in order of apparent amount of sickness, most prevalent one first.	Per Cent of Reports Stating Presence of.[d]	Av. Order of Prevalence where Present.[e]
		WESTERN DIVISION.[*]			BAY AND EASTERN DIV.[*]			CENTRAL DIVISION.[*]		
More sickness than av. for 26 diseases.	1	Intermittent Fever	89	1.9	Intermittent Fever	84	2.0	Intermittent Fever	82	2.2
	2	Remittent Fever	75	2.5	Bronchitis	71	4.1	Rheumatism	60	4.5
	3	Neuralgia	81	4.7	Neuralgia	71	4.6	Remittent Fever	55	3.4
	4	Bronchitis	70	5.1	Rheumatism	75	5.1	Bronchitis	53	3.6
	5	Tonsilitis	65	5.5	Remittent Fever	53	3.9	Consumption	70	5.9
	6	Rheumatism	64	5.9	Tonsilitis	55	4.9	Diarrhea	43	3.6
	7	Influenza	52	4.4	Influenza	42	3.4	Neuralgia	52	4.6
	8	Diarrhea	53	5.9	Whooping-cough	46	4.4	Influenza	35	2.9
	9	Pneumonia	46	5.9	Diarrhea	44	4.5	Tonsilitis	43	4.1
	10	Diphtheria	49	7.4	Consumption, Pul.	61	6.2	Whooping-cough	31	4.0
	11	Consumption, Pul.	55	8.1	Pneumonia	46	5.4	Pneumonia	39	4.9
		Av. of 26 Diseases	38	6.1	Av. of 26 Diseases	34	4.9	Av. of 26 Diseases	30	4.5
Less.	12	Cholera Morbus	30	6.9	Diphtheria	35	5.3	Diphtheria	28	5.3
	13	Whooping-cough	32	7.6	Typho-malarial Fev.	32	5.8	Measles	17	4.2
		SOUTH-WESTERN DIV.[*]			SOUTH'N-CENTRAL DIV.[*]			SOUTH-EASTERN DIV.[*]		
More sickness than av. for 26 dis.	1	Intermittent Fever	89	2.8	Intermittent Fever	87	2.0	Intermittent Fever	83	3.0
	2	Consumption, Pul.	91	5.0	Bronchitis	71	3.1	Consumption, Pul.	90	5.2
	3	Remittent Fever	75	3.3	Rheumatism	72	4.2	Rheumatism	75	4.7
	4	Rheumatism	80	4.9	Neuralgia	61	4.1	Bronchitis	67	4.1
	5	Influenza	52	2.5	Remittent Fever	54	3.3	Influenza	51	2.9
	6	Bronchitis	56	3.7	Consumption, Pul.	64	5.5	Remittent Fever	55	3.2
	7	Neuralgia	72	4.6	Influenza	36	3.0	Diarrhea	55	4.8
	8	Tonsilitis	42	3.8	Diarrhea	44	3.8	Neuralgia	56	5.2
	9	Diarrhea	43	4.5	Tonsilitis	45	4.1	Tonsilitis	48	4.7
	10	Whooping-cough	35	4.0	Pneumonia	38	4.4	Pneumonia	48	5.7
		Av. of 26 Diseases	33	4.4	Av. of 26 Diseases	29	4.2	Av. of 26 Diseases	38	5.4
Less.	11	Pneumonia	37	4.9	Erysipelas	26	5.9	Typho-malarial Fev.	30	4.5
	12	Typho-malarial Fev.	21	4.7	Measles	18	4.0	Measles	30	4.8
	13	Diphtheria	21	5.2	Whooping-cough	18	4.7	Whooping-cough	44	6.3

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[*] For counties in each division see Exhibit 1, page 257.

[†] Judging from the per cent of reports in connection with the "average order of prevalence where prevalent."

[d], [e]. See foot-notes with these marks on page 315.

TABLE 4.—*A Summary for the Year 1880, relative to Diseases in each of the Six Divisions of the State from which the most Weekly Reports were received,—indicating the prevalence as regards both Time and Area.—From Statements on pages 316–19 and 326–75.*

DISEASES.	WESTERN DIV.*				BAY AND EASTERN.				CENTRAL DIV.*				S. WESTERN DIV.*				S. CENTRAL DIV.*				S. EASTERN DIV.*			
	Per Cent of Observers Reporting Presence of.[b]	Average Per Cent of Weeks Reported Present where Present.[c]	Per Cent of Reports Stating Presence of.[d]	Av. Order of Prevalence where Present.[e]	Per Cent of Observers Reporting Presence of.[b]	Average Per Cent of Weeks Reported Present where Present.[c]	Per Cent of Reports Stating Presence of.[d]	Av. Order of Prevalence where Present.[e]	Per Cent of Observers Reporting Presence of.[b]	Average Per Cent of Weeks Reported Present where Present.[c]	Per Cent of Reports Stating Presence of.[d]	Av. Order of Prevalence where Present.[e]	Per Cent of Observers Reporting Presence of.[b]	Average Per Cent of Weeks Reported Present where Present.[c]	Per Cent of Reports Stating Presence of.[d]	Av. Order of Prevalence where Present.[e]	Per Cent of Observers Reporting Presence of.[b]	Average Per Cent of Weeks Reported Present where Present.[c]	Per Cent of Reports Stating Presence of.[d]	Av. Order of Prevalence where Present.[e]	Per Cent of Observers Reporting Presence of.[b]	Average Per Cent of Weeks Reported Present where Present.[c]	Per Cent of Reports Stating Presence of.[d]	Av. Order of Prevalence where Present.[e]
Av. for Tabulated Diseases Reported Present	49	77	38	6.1	47	71	34	4.9	42	71	30	4.5	41	76	33	4.4	39	74	29	4.2	48	79	38	5.4
Brain, Inflammation of	16	40	6	10.9	14	32	4	8.5	16	54	8	7.5	8	35	2	5.6	8	44	3	6.4	23	74	17	9.8
Bowels, Inflammation of	28	54	15	10.2	25	39	10	6.7	22	53	11	7.0	15	36	6	6.4	21	43	9	5.5	41	65	27	8.3
Bronchitis	79	88	70	5.1	82	87	71	4.1	69	79	53	3.6	76	73	56	3.7	81	88	71	3.1	79	85	67	4.1
Cerebro-spinal Meningitis	6	43	3	14.5	5	24	1	8.0	4	33	1	7.4	1	25	0.3	9.0	9	43	4	6.0	5	27	1	5.2
Cholera Infantum	31	69	22	6.7	25	62	16	4.9	19	51	10	5.7	14	50	7	6.1	21	54	11	4.6	25	74	19	5.1
Cholera Morbus	46	64	30	6.9	32	59	19	5.9	32	48	15	5.1	30	55	17	5.4	31	57	18	4.7	42	61	26	5.3
Consumption, Pulmonary	59	93	55	8.1	74	82	61	6.2	78	89	70	5.9	95	96	91	5.0	70	92	64	5.5	92	97	90	5.2
Croup, Membranous	18	42	7	9.0	18	38	7	7.6	8	36	3	6.3	6	35	2	4.8	10	45	5	5.9	18	82	14	10.9
Diphtheria	61	77	49	7.4	60	58	35	5.3	48	59	28	5.3	40	53	21	5.2	26	54	14	5.6	45	77	34	7.1
Diarrhea	68	77	53	5.9	61	68	44	4.5	62	70	43	3.6	55	76	43	4.5	58	77	44	3.8	69	78	55	4.8
Dysentery	45	70	32	7.6	24	56	14	6.1	27	57	15	5.1	28	46	13	5.3	25	57	14	5.0	36	70	26	6.9
Erysipelas	55	66	37	8.3	41	50	21	6.3	29	52	14	5.6	49	52	26	6.3	45	59	26	5.9	57	62	35	7.3
Fever, Intermittent	96	93	89	1.9	92	92	84	2.0	91	91	82	2.2	95	93	89	2.8	94	93	87	2.0	93	89	83	3.0
Fever, Remittent	85	88	75	2.5	61	86	53	3.9	69	80	55	3.4	85	87	75	3.3	63	87	54	3.3	65	83	55	3.2
Fever, Typhoid (Enteric)	18	69	13	10.9	11	53	6	7.1	31	66	20	5.1	11	67	7	7.0	12	48	5	6.9	40	78	32	7.3
Fever, Typho-malarial	44	67	29	7.8	50	63	32	5.8	33	65	20	5.7	38	65	24	4.7	30	58	18	5.1	42	71	30	4.5
Influenza	64	82	52	4.4	57	74	42	3.4	49	73	35	2.9	63	81	52	2.5	47	76	36	3.0	61	83	51	2.9
Measles	34	62	22	6.0	35	44	15	5.5	26	67	17	4.2	19	63	13	6.3	25	74	18	4.0	41	75	30	4.8
Neuralgia	93	88	81	4.7	81	84	71	4.6	71	73	52	4.6	89	80	72	4.6	76	80	61	4.1	69	82	56	5.2
Pneumonia	64	73	46	5.9	70	65	46	5.4	57	68	39	4.9	49	75	37	4.9	59	65	38	4.4	65	74	48	5.7
Puerperal Fever	18	38	7	8.6	8	40	4	6.2	8	49	4	10.6	2	22	1	8.5	7	36	3	6.5	7	39	3	7.3
Rheumatism	80	79	64	5.9	88	85	75	5.1	81	75	60	4.5	88	91	80	4.9	87	83	72	4.2	82	92	75	4.7
Scarlatina	41	63	26	7.8	26	53	14	5.5	27	57	16	5.5	23	65	15	6.0	20	51	11	6.5	38	61	23	8.5
Small-pox	3	25	0.6	7.5	0	0	0	0	0	0	0	0	0	0	0	0	1	32	1	4.3	1	50	0.4	10.0
Tonsilitis	81	81	65	5.5	71	77	55	4.9	62	69	43	4.1	63	65	42	3.8	66	67	45	4.1	63	77	48	4.7
Whooping cough	40	78	32	7.6	62	71	46	4.4	41	78	31	4.0	45	76	35	4.0	24	76	18	4.7	52	83	41	6.3

* For counties in each division see Exhibit 1, page 257. b, c, d, e, See foot-notes with these marks on page 315.

RELATIONS OF BRONCHITIS TO METEOROLOGICAL CONDITIONS.

PROPOSITION 1.—That **more** than the average per cent of weekly reports stated the presence of Bronchitis in months when the average daily range of temperature, the relative humidity of the atmosphere, the ozone, the average velocity of the wind, the monthly and the average daily range of the barometer, and the average daily pressure of the atmosphere were **greater** than the average for the year; and **less** than the average per cent of reports stated the presence of Bronchitis in the months when these conditions were **less** than the average for the year. In Exhibit 12, page 381, the letter *a* marks exceptions to this proposition for the year 1880.

As regards average daily range of barometer there is, for 1880, no exception to Proposition 1.

PROPOSITION 2.—That **more** than the average per cent of weekly reports stated the presence of Bronchitis in months when the average daily temperature, and the absolute humidity of the atmosphere, were **less** than the average for the year; and **less** than the average per cent of reports stated the presence of Bronchitis in months when these conditions were greater than the average for the year. In Exhibit 12, page 381, the letter *b* marks exceptions to this proposition for the year 1880.

What per cent of the weekly reports received in 1880 stated presence of Bronchitis is graphically represented by months in Diagram 1, page 308.

PROPOSITION 3.—For those months which are not, as regards the absolute humidity of the atmosphere, exceptions to proposition 2, it is true also that the quantity of vapor inhaled daily was **less** than the average, and the quantity exhaled daily in excess of that inhaled was **greater** than the average, in months when **more** than the average per cent of reports stated presence of Bronchitis; and that **more** vapor was inhaled and a **less** excess exhaled daily in months when the per cent of reports stating presence of bronchitis was **less** than the average.

Proposition 3 would also hold true in relation to pneumonia, membranous croup, diphtheria, tonsilitis, influenza, rheumatism, neuralgia, and pulmonary consumption, treated in Exhibits 13–20, on following pages.

RANGE OF PRESSURE OF ATMOSPHERE.

In the preparation of the Exhibits concerning the relations of Bronchitis and other diseases to certain meteorological conditions, the daily range of barometer, from which the average daily range for the month has been computed, was determined from four observations for the day, at 7 A. M., 2 P. M., 9 P. M., and 7 A. M. of the following day, thus taking into account changes during the night, and not as for former years from the three observations, at 7 A. M., 2 P. M., and 9 P. M. It may be seen that the average daily range of barometer as thus determined seems to have a closer relation to prevalence of the so-called winter diseases than when determined from the three observations during the one day.

EXHIBIT 12.—BRONCHITIS.—*Per Cent of Weekly Reports of Diseases in Michigan, Stating Presence of Bronchitis during the Year and during each Month of the Year 1880, Compared with Coincident Meteorological Conditions observed at the Office of the State Board of Health, Lansing, Michigan, which is near the center of the thickly-settled part of the State.*[*]

Months in Order of Per Cent of Weekly Reports Stating Presence of Bronchitis.[†]		Per Cent of Weekly Reports Stating Presence of Bronchitis.[†]	Av. Order of Prevalence where Present.[†], [‡]	Temperature, Degrees Fahr.: Av. Range during Day and following Night, by Registering Thermometers,—Observed at 7 A. M.	Temperature, Mean: Av. of Daily Observations at 7 A. M., 2 P. M., and 9 P. M.	Temperature, Mean: One-fourth of (7 A. M.+2 P. M.+twice 9 P. M. observation.)	Humidity of Atmosphere.[§] Av. of Observations at 7 A. M., 2 P. M., and 9 P. M., Daily: Relative Humidity, or Per Cent of Saturation.	Humidity: Absolute Humidity—Grs. of Vapor in a Cubic Foot of Air.	Vapor Inhaled and Exhaled: Ounces (Troy) of Vapor Inhaled by one Person in 24 Hours.[‖]	Vapor Inhaled and Exhaled: Ounces (Troy) of Vapor Exhaled from Air Passages in 24 Hours, in Excess of Vapor Inhaled.[¶]	Ozone,—Relative. Scale of 10 Degrees of Coloration: Day Observation,—7 A. M. to 2 P. M.	Ozone: Night Observation,—9 P. M. to 7 A. M.	Av. Velocity of the Wind, Miles per Hour,—By Robinson's Registering Anemometer.	Pressure of Atmosphere. Inches of Mercury. (Reduced to 32° F.) Range of Barometer: Monthly, and for Year.	Range of Barometer: Av. Daily, from 7 A. M. to 7 A. M., by Observations at 7 A. M., 2 P. M., and 9 P. M.	Average Pressure.
YEAR 1880.		64	3.7	**111°	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	1.514	.215	29.016
More than the Av. Per Cent of Bronchitis.	Feb..	84	3.1	*a*18.17	31.60	31.62	*a* 58	1.74	1.09	10.59	4.38	4.97	12.7	1.253	.316	*a*28.973
	Mar.	82	3.2	19.45	34.34	34.19	*a* 63	1.75	1.09	10.59	*a* 3.42	*a* 3.81	12.8	1.422	.314	29.042
	Jan..	81	3.1	*a*17.10	37.10	36.81	75	2.22	1.39	10.29	*a* 2.90	*a* 3.16	11.0	1.174	.322	*a*28.998
	Dec..	72	2.9	*a*10.74	21.80	21.65	78	1.30	0.81	10.87	4.55	5.26	*a* 7.4	1.370	.252	*a*29.011
	Apr..	68	3.6	20.63	47.50	47.46	*a* 59	2.76	1.73	9.95	4.28	4.93	13.8	*a* .954	.282	*a*28.916
	Nov..	67	3 4	*a*15.33	29.17	28.78	72	1.67	1.04	10.64	4.33	5.60	*a* 8.6	1.014	.234	29.113
Average.		64	3.7	18.61	49.25	48,94	68	3.49	2.18	9.50	3.70	4.14	9.4	.990	.215	29.016
Less than the Av. Per Cent of Bronchitis.	May.	59	3.5	*a*20.65	66.03	65.48	60	4.76	2.98	8.70	*a* 3.81	*a* 4.32	*a* 10.4	.922	.157	29.002
	Oct..	57	4.1	*a*20.16	*b*48.99	*b*48.64	*a* 69	*b* 3.16	1.98	9.70	3.19	3.71	7.8	*a*1.022	.215	*a*29.043
	June	57	4.1	18.43	69.79	69.44	67	5.60	3.50	8.18	3.53	3.87	8.3	.916	.136	28.983
	Sept.	46	4.8	*a*21.17	61.71	61.19	*a* 69	4.72	2.95	8.73	*a* 3.73	3.60	8.1	.643	.129	*a*29.058
	Aug.	45	5.2	*a*20.65	70.70	70.38	*a* 72	6.06	3.79	7.89	2.90	2.87	5.9	.644	.121	*a*29.052
	July.	44	5.2	*a*20.81	72.27	71.69	*a* 69	6.12	3.83	7.85	3.39	3.61	6.5	.519	.105	28.996

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[*] Additional statements relative to meteorological conditions may be found in an article on the Principal Meteorological Conditions in Michigan in 1880, on following pages of this Report. Statements relative to the soil-moisture and ground water, by months in 1880, are given in Exhibits 5 and 6, and in summary foot-notes on pages 267-9.

[†] Explanations of statements in these columns, and other statements relative to the prevalence, in 1880, of the disease under consideration, may be found in Tables 2, pp. 314-323, 3, pp. 326-375, and 4, page 379, of this Report, and also in Diagrams 1, (p. 308), 2, (p. 382,) 3, and 4, on following pages.

[‡] Small numbers in this column indicate great prevalence in the localities where the disease occurred, as compared with other diseases; and large numbers a less prevalence.

[§] Calculated from readings of dry-bulb and wet-bulb thermometers.

[‖] Calculated for 18 respirations per minute, of 20 cubic inches of air each. The numbers in this column are just five-eighths those in the next preceding column.

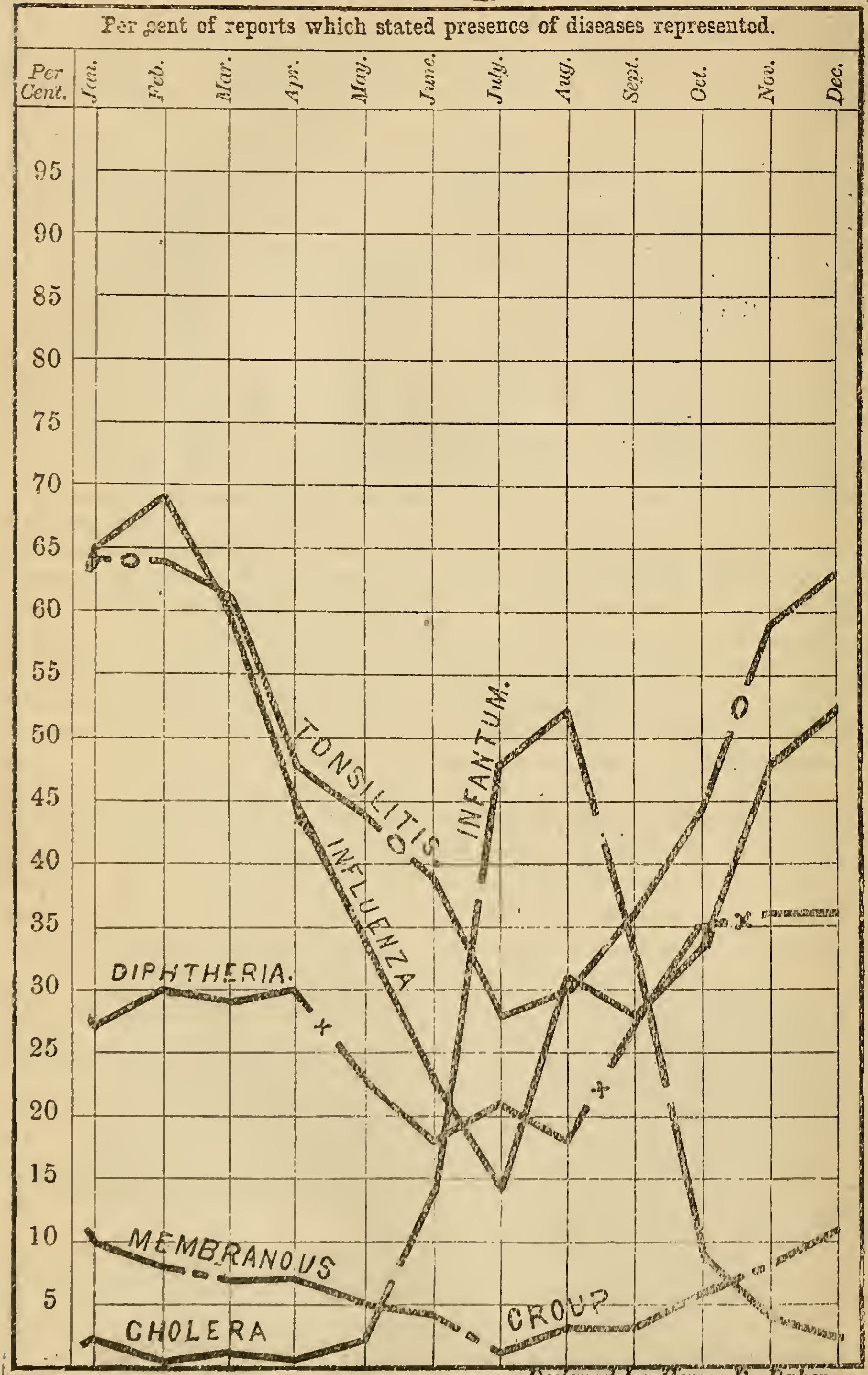
[¶] Assuming the air exhaled to be saturated with vapor at the temperature of 98° F., in which case each cubic foot of air contains 18.69 grains of vapor, and 18 respirations per minute, of 20 cubic inches of air each, make 11.68 Troy ounces of vapor exhaled daily. No correction has been made for expansion of the air after it is inhaled.

[**] Not an average, but the extreme range for the year.

[a] An exception to the proposition that **more** than the average per cent of weekly reports stated presence of bronchitis in months when the meteorological condition named at the head of the column was **greater** than the average for the year; and **less** in months when the same condition was **less** than the average. As regards average daily range of barometer there is, for 1880, no exception to the proposition.

[b] An exception to the proposition that **more** than the average per cent of weekly reports stated presence of bronchitis in months when the meteorological condition named at the head of the column was **less** than the average for the year; and **less** in months when the same condition was **greater** than the average for the year.

DIAGRAM 2.—WEEKLY REPORTS OF DISEASES IN MICHIGAN, IN 1880.



Designed by Henry B. Baker.

RELATIONS OF PNEUMONIA TO METEOROLOGICAL CONDITIONS.

PROPOSITION 1.—That **more** than the average per cent of weekly reports stated the presence of pneumonia in months when the average daily range of temperature, the relative humidity of the atmosphere, the ozone, the average velocity of the wind, the monthly and the average daily range of the barometer, and the average daily pressure of the atmosphere were **greater** than the average for the year; and **less** than the average per cent of the reports stated the presence of pneumonia in months when these conditions were **less** than the average for the year. In Exhibit 13, below, the letter *a* marks exceptions to this proposition for the year 1880.

EXHIBIT 13.—PNEUMONIA.—*Per Cent of Weekly Reports of Diseases in Michigan, Stating Presence of Pneumonia, during the Year and during each Month of the Year 1880, Compared with Coincident Meteorological Conditions observed at the Office of the State Board of Health, Lansing, Mich., which is near the center of the thickly-settled part of the State.**

Months in Order of Per Cent of Weekly Reports Stating Presence of Pneumonia. †		Per Cent of Weekly Reports Stating Presence of Pneumonia. †	Av. Order of Prevalence where Present. †, ‡	Temperature, Degrees Fahr.			Humidity of Atmosphere.§ Av. of Observations at 7 A. M., 2 P. M., and 9 P. M., Daily.		Vapor Inhaled and Exhaled.		Ozone,—Relative. Scale of 10 Degrees of Coloration.		Average Velocity of Wind, Miles per Hour,—By Registering Anemometer.	Pressure of Atmosphere. Inches of Mercury. (Reduced to 32° F.)		
					Mean.									Range of Barometer.		
				Av. Range during Day and following Night, by Registering Thermometers,—Observed at 7 A. M.	Av. of Daily Observations, at 7 A. M., 2 P. M., and 9 P. M.	One-fourth of (7 A. M. + 2 P. M. + twice 9 P. M. observation.)	Relative Humidity, or Per Cent of Saturation.	Absolute Humidity—Grs. of Vapor in a Cubic Foot of Air.	Ounces (Troy) of Vapor Inhaled by one Person in 24 Hours. ||	Ounces (Troy) of Vapor Exhaled from Air Passages in 24 Hours, in Excess of Vapor Inhaled. ¶	Day Observation,—7 A. M. to 2 P. M.	Night Observation,—9 P. M. to 7 A. M.		Monthly, and for Year.	Av. Daily, from 7 A. M. to 7 A. M., by Observations at 7 A. M., 2 P. M., and 9 P. M.	Average Pressure.
Year 1880.		42	5.1	*¶111°	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	1.514	.215	29.016
More than the Av. Per Cent of Pneumonia.	Feb.	73	4.1	*a*18.17	31.60	31.62	*a* 58	1.74	1.09	10.59	4.38	4.97	12.7	1.253	.316	*a*28.973
	Mar.	72	4.0	19.45	34.34	34.19	*a* 63	1.75	1 09	10.59	*a* 3.42	*a* 3.81	12.8	1.422	.314	29.042
	Jan.	62	4.4	*a*17.10	37.10	36.81	75	2.22	1.39	10.29	*a* 2.90	*a* 3.16	11.0	1.174	.322	*a*28.998
	Apr.	62	4.5	20.63	47.50	47.46	*a* 59	2.76	1.73	9.95	4.28	4.93	13.8	*a*.954	.282	*a*28.916
	Dec.	49	5.0	*a*10.74	21.80	21.65	78	1.30	0.81	10.87	4.55	5.26	*a* 7.4	1.370	.252	*a*29.011
	May.	43	5.3	20.65	*b*66.03	*b*65.48	*a* 60	*b* 4.76	2.98	8.70	3.81	4.32	10.4	*a* .922	*a* .157	*a*29.002
Average.		42	5.1	18.61	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	.990	.215	29.016
Less than the Av. Per Cent of Pneumonia.	Nov.	39	5.8	15.33	*b*29.17	*b*28.78	*a* 72	*b* 1.67	1.04	10.64	*a* 4.33	*a* 5.60	8.6	*a*1.014	*a* .234	*a*29.113
	June	24	5.8	18.43	69.79	69.44	67	5.60	3.50	8.18	3.53	3.87	8.3	.916	.136	28.983
	Oct.	23	6.5	*a*20.16	*b*48.99	*b*48.64	*a* 69	*b* 3.16	1.98	9.70	3.19	3.71	7.8	*a*1.022	.215	*a*29.043
	Sept.	18	6.1	*a*21.17	61.71	61.19	*a* 69	4.72	2.95	8.73	*a* 3.73	3.60	8.1	.643	.129	*a*29.058
	July.	16	6.3	*a*20.81	72.27	71.69	*a* 69	6.12	3.83	7.85	3.39	3.61	6.5	.549	.105	28.996
	Aug.	13	7.3	*a*20.65	70.70	70.38	*a* 72	6.06	3.79	7.89	2.90	2.87	5.9	.644	.121	*a*29.052

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*, †, ‡, §, ||, ¶, **. See foot-notes with these marks, in Exhibit 12, page 381.
a Exceptions to proposition 1, page 383.
b Exceptions to proposition 2, page 384.

PROPOSITION 2.—That **more** than the average per cent of weekly reports stated the presence of pneumonia in months when the average daily temperature and the absolute humidity of the atmosphere were **less** than the average for the year; and **less** than the average per cent of reports stated the presence of pneumonia in months when these conditions were **greater** than the average for the year. In Exhibit 13, page 383, the letter *b* marks exceptions to this proposition for the year 1880.

What per cent of the weekly reports received in 1880 stated presence of pneumonia is graphically represented by months in Diagram 1, page 308.

RELATIONS OF MEMBRANOUS CROUP TO METEOROLOGICAL CONDITIONS.

PROPOSITION 1.—That **more** than the average per cent of weekly reports stated the presence of membranous croup in months when the average daily range of temperature, the relative humidity of the atmosphere, the ozone, the average velocity of the wind, the monthly and the average daily range of the barometer, and the average daily pressure of the atmosphere were **greater** than the average for the year; and **less** than the average per cent of reports stated the presence of membranous croup in months when these conditions were **less** than the average for the year. In Exhibit 14, page 385, the letter *a* marks exceptions to this proposition for the year 1880.

PROPOSITION 2.—That **more** than the average per cent of weekly reports stated the presence of membranous croup in months when the average daily temperature and the absolute humidity of the atmosphere were **less** than the average for the year, and **less** than the average per cent of reports stated the presence of membranous croup in months when these conditions were **greater** than the average for the year.

In Exhibit 14, page 385, it is shown that there is no exception to the above proposition for the year 1880.

What per cent of the weekly reports received in 1880 stated presence of membranous croup is graphically represented by months in Diagram 2, page 382.

EXHIBIT 14.—MEMBRANOUS CROUP.—*Per Cent of Weekly Reports of Diseases in Michigan, Stating Presence of Membranous Croup during the Year and during each Month of the Year 1880, Compared with Coincident Meteorological Conditions, Observed at the Office of the State Board of Health, Lansing, Michigan, which is near the thickly-settled part of the State.**

MONTHS IN ORDER OF PER CENT OF WEEKLY REPORTS STATING PRESENCE OF MEMBRANOUS CROUP. †		Per Cent of of Weekly Reports Stating Presence of Membranous Croup. †	Average Order of Prevalence where Present. †, ‡	TEMPERATURE, Degrees Fahr.			HUMIDITY OF ATMOSPHERE. § Av. of Observations at 7 A. M., 2 P. M., and 9 P. M. Daily.		VAPOR INHALED AND EXHALED.		OZONE,—RELATIVE. Scale of 10 Degrees of Coloration.		Average Velocity of Wind, Miles per Hour,—by Robinson's Registering Anemometer.	PRESSURE OF ATMOSPHERE. Inches of Mercury. Corrected for Temperature.—Reduced to 32° F.		
				Av. Range during Day and following Night, by Registering Thermometers,—Observed at 7 A. M.	MEAN.									RANGE OF BAROMETER.		
					Av. of Daily Observations at 7 A. M., 2 P. M., and 9 P. M.	One-fourth of (7 A. M. + 2, P. M. + twice 9 P. M. Observations)	Relative Humidity, or Per Cent of Saturation.	Absolute Humidity,—Grs. of Vapor in a Cubic foot of Air.	Ounces (Troy) of Vapor Inhaled by one Person in 24 Hours.‖	Ounces (Troy) of Vapor Exhaled from Air Passages in 24 Hours, in excess of Vapor Inhaled. ¶	Day Observation,—7 A. M. to 2 P. M.	Night Observation,—9 P. M. to 7 A. M.		Monthly, and for Year.	Av. Daily from 7 A. M. to 7 A. M., by Observations at 7 A. M., 2 P. M., and 9 P. M.	Average Pressure.
Year 1880..		6	7.4	**111°	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	1.514	.215	29.016
More than Av. Per Cent of Membranous Croup.	Dec...	11	7.1	*a*10.74	21.80	21.65	78	1.30	0.81	10.87	4.55	5.26	*a* 7.4	1.370	.252	29.011
	Jan...	10	6.3	*a*17.10	37.10	36.81	75	2.22	1.39	10.29	*a* 2.90	*a* 3.16	11.0	1.174	.322	*a*28.998
	Nov..	8	7.5	*a*15.33	29.17	28.78	72	1.67	1.04	10.64	4.33	5.60	*a* 8.6	1.014	.234	29.113
	Feb...	8	7.1	*a*18.17	31.60	31.62	*a* 58	1.74	1.09	10.59	4.38	4.97	12.7	1.253	.316	*a*28.973
	Mar...	7	7.6	19.45	34.34	34.19	*a* 63	1.75	1.09	10.59	*a* 3.42	*a* 3.81	12.8	1.422	.314	29.042
	April.	7	8.4	20.63	47.50	47.46	*a* 59	2.76	1.73	9.95	4.28	4.93	13.8	*a* .954	.282	*a*28.916
	Oct...	6	7.0	20.16	48.99	48.64	69	3.16	1.98	9.70	*a* 3.19	*a* 3.71	*a* 7.8	1.022	*a* .215	29.043
Average..		6	7.4	18.61	*c* 49.25	*c* 48.94	68	*c* 3.49	2.18	9.50	3.70	4.14	9.4	.990	.215	29.016
Less than Av. Per Ct. of Memb. Croup.	May..	5	6.8	*a*20.65	66.03	65.48	60	4.76	2.98	8.70	*a* 3.81	*a* 4.32	*a* 10.4	.922	.157	29.002
	June..	4	7.2	18.43	69.79	69.44	67	5.60	3.50	8.18	3.53	3.87	8.3	.916	.136	28.983
	Sept..	3	8.2	*a*21.17	61.71	61.19	*a* 69	4.72	2.95	8.73	*a* 3.73	3.60	8.1	.643	.129	*a*29.058
	Aug..	3	12.4	*a*20.65	70.70	70.38	*a* 72	6.06	3.79	7.89	2.90	2.87	5.9	.644	.121	*a*29.052
	July..	1	5.0	*a*20.81	72.27	71.69	*a* 69	6.12	3.83	7.85	3.39	3.61	6.5	.549	.105	28.996

*, †, ‡, §, ‖, ¶, **. See foot-notes with these marks, in Exhibit 12, page 381.
a Exceptions to proposition 1, on page 384.
c There is no exception (for 1880) to proposition 2, on page 384.

RELATIONS OF DIPHTHERIA TO METEOROLOGICAL CONDITIONS.

PROPOSITION 1.—That **more** than the average per cent of weekly reports stated the presence of diphtheria in months when the average daily range of temperature, the relative humidity of the atmosphere, the ozone, the average velocity of the wind, the monthly and the average daily range of the barometer, and the average daily pressure of the atmosphere were **greater** than the average for the year; and **less** than the average per cent of reports stated presence of diphtheria in months when these conditions were **less** than the average for the year. In Exhibit 15, page 386, the letter *a* marks exceptions to this proposition for the year 1880.

Explanations of propositions 1 and 2, are given on page 387; and summaries of the evidence of the exhibit are given in Exhibits 24 and 25, near the close of this article.

PROPOSITION 2.—That **more** than the average per cent of weekly reports stated the presence of diphtheria in months when the average daily temperature and the absolute humidity of the atmosphere were **less** than the average for the year; and **less** than the average per cent of reports stated the presence of diphtheria in months when these conditions were **greater** than the average for the year. In Exhibit 15, below, the letter *b* marks exceptions to this proposition for the year 1880.

What per cent of the weekly reports in each month in 1880 stated the presence of diphtheria is graphically represented in Diagram 2, page 382.

EXHIBIT 15.—DIPHTHERIA.—*Per Cent of Weekly Reports of Diseases in Michigan, Stating Presence of Diphtheria during the Year and during the Month of the Year 1880, Compared with Coincident Meteorological Conditions observed and recorded at the Office of the State Board of Health, Lansing, Michigan, which is near the center of the thickly-settled part of the State.**

				TEMPERATURE, Degrees Fahr.			HUMIDITY OF ATMOSPHERE.§ Av. of Observations at 7 A. M., 2 P. M., and 9 P. M., Daily.		VAPOR INHALED AND EXHALED.		OZONE,—RELATIVE. Scale of 10 Degrees of Coloration.			PRESSURE OF ATMOSPHERE. Inches of Mercury, (Reduced to 32° F.)		
					MEAN.									RANGE OF BAROMETER.		
	MONTHS IN ORDER OF PER CENT OF WEEKLY REPORTS STATING PRESENCE OF DIPHTHERIA.†	Per Cent of Weekly Reports Stating Presence of Diphtheria.†	Average Order of Prevalence where Present.†‡	Av. Range during Day and following Night, by Registering Thermometers,—Observed at 7 A. M.	Average of Daily Observations at 7 A. M., 2 P. M., and 9 P. M.	One-fourth of (7 A. M. + 2 P. M. + twice 9 P. M. Observation).	Relative Humidity, or Per Cent of Saturation.	Absolute Humidity,—Grs. of Vapor in a Cubic Foot of Air.	Ounces (Troy) of Vapor Inhaled by one Person in 24 Hours.‖	Ounces (Troy) of Vapor Exhaled from Air Passages in 24 Hours, in Excess of Vapor Inhaled.¶	Day Observation,—7 A. M. to 2 P. M.	Night Observation,—9 P. M. to 7 A. M.	Average Velocity of Wind, Miles per Hour,—By Registering Anemometer.	Monthly and for Year.	Av. Daily, from 7 A. M. to 7 A. M., by Observations at 7 A. M., 2 P. M., and 9 P. M.	Average Pressure.
	YEAR 1880.	27	5.7	**111°	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	1.514	.215	29.016
More than Av. Per Cent of Diphtheria.	Dec..	36	4.7	*a*10.74	21.80	21.65	78	1.30	0.81	10.87	4.55	5.26	*a* 7.4	1.370	.252	29.011
	Nov..	36	4.6	*a*15.33	29.17	28.78	72	1.67	1.04	10.64	4.33	5.60	*a* 8.6	1.014	.234	29.113
	Oct..	35	5.5	20.16	48.99	48.64	69	3.16	1.98	9.70	*a* 3.19	*a* 3.71	*a* 7.8	1.022	*a* .215	29.043
	Apr..	30	6.5	20.63	47.50	47.46	*a* 59	2.76	1.73	9.95	4.28	4.93	13.8	*a* .954	.282	*a*28.916
	Feb..	30	5.6	*a*18.17	31.60	31.62	*a* 58	1.74	1.09	10.59	4.38	4.97	12.7	1.253	.316	*a*28.973
	Mar.	29	5.8	19.45	34.34	34.19	*a* 63	1.75	1.09	10.59	*a* 3.42	*a* 3.81	12.8	1.422	.314	29.042
	Average...	27	5.7	18.61	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	.990	.215	29.016
Less than Average Per Cent of Diphtheria.	Jan..	27	5.0	17.10	*b*37.10	*b*36.81	*a* 75	*b* 2.22	1.39	10.29	2.90	3.16	*a* 11.0	*a*1.174	*a* .322	28.998
	Sept.	27	6.0	*a*21.17	61.71	61.19	*a* 69	4.72	2.95	8.73	*a* 3.73	3.60	8.1	.643	.129	*a*29.058
	May.	23	5.9	*a*20.65	66.03	65.48	60	4.76	2.98	8.70	*a* 3.81	*a* 4.32	*a* 10.4	.922	.157	29.002
	July	21	6.4	*a*20.81	72.27	71.69	*a* 69	6.12	3.83	7.85	3.39	3.61	6.5	.549	.105	28.996
	June	18	7.0	18.43	69.79	69.44	67	5.60	3.50	8.18	3.53	3.87	8.3	.916	.136	28.983
	Aug.	18	6.8	*a*20.65	70.70	70.38	*a* 72	6.06	3.79	7.89	2.90	2.87	5.9	.644	.121	*a*29.052

*, †, ‡, §, ‖, ¶, **. See foot-notes with these marks, in Exhibit 12, page 381.
a An exception to proposition 1, relative to diphtheria, on page 385.
b An exception to proposition 2, relative to diphtheria, on page 386.

Explanation of Exhibits 12–23,—Sickness and Meteorology.—Each of these exhibits, showing the relations of meteorological conditions to sickness, requires to be studied one column at a time, after the first three columns; but, with reference to each column, the reader must hold in mind the general fact, conveyed by the first three columns, as to whether there was more or less than the average sickness.

It will be seen that each proposition printed in connection with these exhibits, is a double one, covering months (above and below the average line) in which the sickness was more and in which it was less than the average for the year. The number of months studied, in each exhibit, being twelve, if in any column the exceptions (noted by reference letters) are more than six the proposition is exactly the reverse of the truth, for the year 1880, with respect to the particular condition to which the column relates; if the exceptions are less than six the proposition holds true for a majority of the months with respect to the particular condition thus studied.

The number of months in the twelve for the year for which each proposition holds true, with respect to each meteorological condition in its relations to each important disease, is shown in Exhibits 24 and 25 near the close of this article; so that the reader who has mastered the plan can there see, in a very condensed form, a summary of the evidence.

RELATIONS OF TONSILITIS TO METEOROLOGICAL CONDITIONS.

Proposition 1.—That **more** than the average per cent of weekly reports stated the presence of Tonsilitis in months when the average daily range of temperature, the relative humidity of the atmosphere, the ozone, the average velocity of the wind, the monthly and the average daily range of the barometer and the average daily pressure of the atmosphere, were **greater** than the average for the year; and **less** than the average per cent of reports stated the presence of Tonsilitis in months when these conditions were **less** than the average for the year. In Exhibit 16, page 388, the letter *a* marks exceptions to this proposition for the year 1880.

Explanations of propositions 1 and 2, are given on page 387; and summaries of the evidence of the exhibit are given in Exhibits 24 and 25, near the close of this article.

Proposition 2.—That **more** than the average per cent of weekly reports stated the presence of Tonsilitis in months when the average daily temperature and the absolute humidity of the atmosphere were **less** than the average for the year; and **less** than the average per cent of reports stated the presence of Tonsilitis in months when these conditions were **greater** than the average for the year. In Exhibit 16, page 388, there is no exception to this proposition for the year 1880.

What per cent of the weekly reports in each month in 1880 stated the presence of Tonsilitis is graphically represented in Diagram 2, page 382.

EXHIBIT 16.—TONSILITIS.—*Per Cent of Weekly Reports of Diseases in Michigan, Stating Presence of Tonsilitis, during the Year and during each Month of the Year 1880, Compared with Coincident Meteorological Conditions observed at the office of the State Board of Health, Lansing, Michigan, which is near the center of the thickly-settled part of the State.**

	Months in Order of Per Cent of Weekly Reports stating Presence of Tonsilitis.†	Per Cent of Weekly Reports Stating Presence of Tonsilitis.†	Av. Order of Prevalence where Present.†, ‡.	Temperature. Degrees Fahr.			Humidity of Atmosphere.§ Av. of Observations at 7 A. M., 2 P. M., and 9 P. M., Daily.		Vapor Inhaled and Exhaled.		Ozone,—Relative. Scale of 10 Degrees of Coloration.		Average Velocity of Wind, Miles per Hour,—By Registering Anemometer.	Pressure of Atmosphere. Inches of Mercury. (Reduced to 32° F.)		
					Mean.									Range of Barometer.		
				Av. Range during Day and following Night, by Registering Thermometers,—Observed at 7 A. M.	Average of Daily Observations at 7 A. M., 2 P. M., and 9 P. M.	One-fourth of (7 A. M. + 2 P. M. + twice 9 P. M. Observation).	Relative Humidity, or Per Cent of Saturation.	Absolute Humidity,—Grs. of Vapor in a Cubic foot of Air.	Ounces (Troy) of Vapor Inhaled by One Person in 24 hours.‖	Ounces (Troy) of Vapor Exhaled from Air Passages in 24 Hours, in Excess of Vapor Inhaled.¶	Day Observation,—7 A. M. to 2 P. M.	Night Observation,—9 P. M. to 7 A. M.		Monthly and for Year.	Av. Daily, from 7 A. M. to 7 A. M., by Observations at 7 A. M., 2 P. M., and 9 P. M.	Average Pressure.
YEAR 1880.		49	4.4	**111°	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	1.514	.215	29.016
More than Av. Per Cent of Tonsilitis.	Feb.	65	3.8	*a*18.17	31.60	31.62	*a* 58	1.74	1.09	10.59	4.38	4.97	12.7	1.253	.316	*a*28.973
	Jan.	64	3.8	*a*17.10	37.10	36.81	75	2.22	1.39	10.29	*a* 2.90	*a* 3.16	11.0	1.174	.322	*a*28.998
	Dec.	63	3.4	*a*10.74	21.80	21.65	78	1.30	0.81	10.87	4.55	5.26	*a* 7.4	1.370	.252	*a*29.011
	Mar.	61	4.1	19.45	34.34	34.19	*a* 63	1.75	1.09	10.59	*a* 3.42	*a* 3.81	12.8	1.422	.314	29.042
	Nov.	59	3.8	*a*15.33	29.17	28.78	72	1.67	1.04	10.64	4.33	5.60	*a* 8.6	1.014	.234	29.113
Average...		49	4.4	18.61	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	.990	.215	29.016
Less than Av. Per Cent of Tonsilitis.	April	48	4.3	*a*20.63	*b*47.50	*b* 47.46	59	*b* 2.76	1.73	9.95	*a* 4.28	*a* 4.93	*a* 13.8	.954	*a* .282	28.916
	Oct.	44	4.6	*a*20.16	*b*48.99	*b* 48.64	*a* 69	*b* 3.16	1.98	9.70	3.19	3.71	7.8	*a*1.022	.215	*a*29.043
	May.	44	4.5	*a*20.65	66.03	65.48	60	4.76	2.98	8.70	*a* 3.81	*a* 4.32	*a* 10.4	.922	.157	29.002
	June	39	4.8	18.43	69.79	69.41	67	5.60	3.50	8.18	3.53	3.87	8.3	.916	.136	28.983
	Sept.	36	5.7	*a*21.17	61.71	61.19	*a* 69	4.72	2.95	8.73	*a* 3.73	3.60	8.1	.643	.129	*a*29.058
	Aug.	30	5.7	*a*20.65	70.70	70.38	*a* 72	6.06	3.79	7.89	2.90	2.87	5.9	.644	.121	*a*29.052
	July.	28	5.6	*a*20.81	72.27	71.69	*a* 69	6.12	3.83	7.85	3.39	3.61	6.5	.549	.105	28.996

*, †, ‡, §, ¶, **. See footnotes with these marks, in Exhibit 12 page 381.
a Exceptions to proposition 1, relative to tonsilitis, on page 387.
b Exceptions to proposition 2, relative to tonsilitis, on page 387.

RELATIONS OF INFLUENZA TO METEOROLOGICAL CONDITIONS.

PROPOSITION 1.—That more than the average per cent of weekly reports stated the presence of influenza in months when the average daily range of temperature, the relative humidity of the atmosphere, the ozone, the average velocity of the wind, the monthly and the average daily range of the barometer, and the average daily pressure of the atmosphere were greater than the average for the year, and less than the average per cent of reports stated the presence of influenza in months when these conditions were less than the average for the year. In Exhibit 17, page 389, the letter *a* marks exceptions to this proposition for the year 1880.

Explanations of propositions 1 and 2, are given on page 387; and summaries

of the evidence of the exhibit are given in Exhibits 24 and 25, near the close of this article.

PROPOSITION 2.—That **more** than the average per cent of weekly reports stated the presence of influenza in months when the average daily temperature and the absolute humidity of the atmosphere were **less** than the average for the year, and **less** than the average per cent of reports stated the presence of influenza in months when these conditions were **greater** than the average for the year. In Exhibit 17, below, the letter *b* marks exceptions to this proposition tion for the year 1880.

What per cent of the weekly reports in each month in 1880 stated the presence of influenza is graphically represented in Diagram 2, page 382.

EXHIBIT 17.—INFLUENZA.—*Per Cent of Weekly Reports of Diseases in Michigan, Stating Presence of Influenza during the Year and during each Month of the Year 1880, Compared with Coincident Meteorological Conditions Observed and Recorded at the Office of the State Board of Health, Lansing, Michigan, which is near the center of the thickly-settled part of the State.**

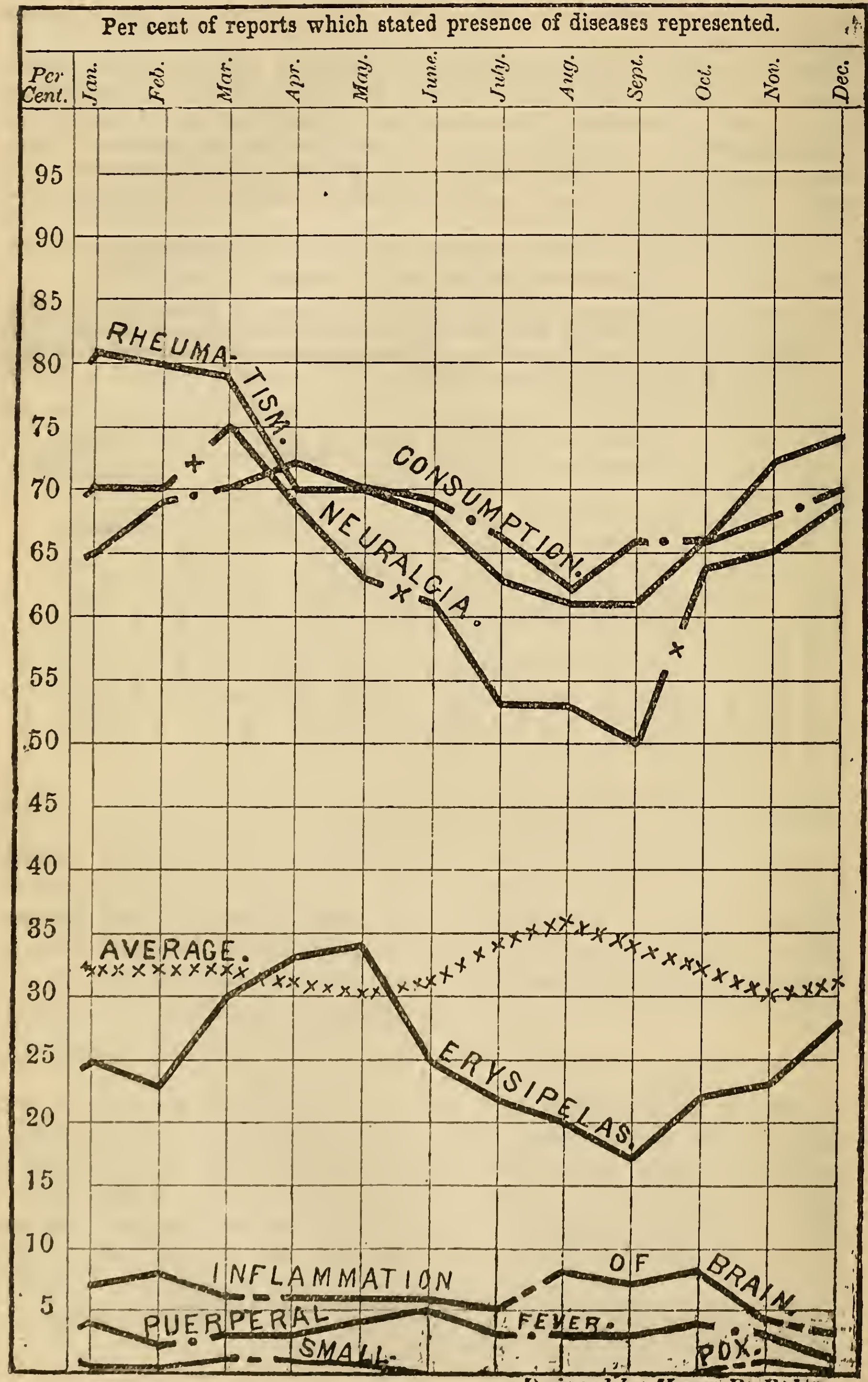
Months in Order of Per Cent of Weekly Reports Stating Presence of Influenza.†		Per Cent of Weekly Reports Stating Presence of Influenza.†	Av. Order of Prevalence where Present. †, ‡	Temperature, Degrees Fahr.			Humidity of Atmosphere.§ Av. of Observations at 7 A. M., 2 P. M., and 9 P. M., Daily.		Vapor Inhaled and Exhaled.		Ozone,—Relative. Scale of 10 Degrees of Coloration.		Av. Velocity of Wind, Miles per Hour,—by Registering Anemometer.	Pressure of Atmosphere. Inches of Mercury. (Reduced to 32° F.)		
				Av. Range during Day and following Night, by Registering Thermometers,—Observed at 7 A. M.	Mean. Av. of Daily Observations, at 7 A. M., 2 P. M., and 9 P. M.	Mean. One-fourth of (7 A. M. + 2 P. M. + twice 9 P. M. observation.)	Relative Humidity, or Per Cent of Saturation.	Absolute Humidity,—Grs. of Vapor in a Cubic Foot of Air.	Ounces (Troy) of Vapor Inhaled by one Person in 24 Hours.‖	Ounces (Troy) of Vapor Exhaled from Air Passages in 24 Hours, in excess of Vapor Inhaled.¶	Day Observation,—7 A. M. to 2 P. M.	Night Observation,—9 P. M. to 7 A. M.		Range of Barometer. Monthly, and for Year.	Range of Barometer. Av. Daily, from 7 A. M. to 7 A. M., by Observations at 7 A. M., 2 P. M., and 9 P. M.	Average Pressure.
YEAR 1880.		42	3.0	**111°	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	1.514	.215	29.016
More than Av. Per Ct. of Influenza.	Feb.	69	2.3	*a*18.17	31.60	31.62	*a* 58	1.74	1.09	10.59	4.38	4.97	12.7	1.253	.316	*a*28.973
	Jan.	65	2.5	*a*17.10	37.10	36.81	75	2.22	1.39	10.29	*a* 2.90	*a* 3.16	11.0	1.174	.322	*a*28.998
	Mar.	60	2.3	19.45	34.34	34.19	*a* 63	1.75	1.09	10.59	*a* 3.42	*a* 3.81	12.8	1.422	.314	29.042
	Dec.	52	2.4	*a*10.74	21.80	21.65	78	1.30	0.81	10.87	4.55	5.26	*a* 7.4	1.370	.252	*a*29.011
	Nov.	48	2.7	*a*15.33	29.17	28.78	72	1.67	1.04	10.64	4.33	5.60	*a* 8.6	1.014	.234	29.113
	Apr.	45	2.8	20.63	47.50	47.46	*a* 59	2.76	1.73	9.95	4.28	4.93	13.8	*a* .954	.282	*a*28.916
Average.		42	3.0	18.61	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	.990	.215	29.016
Less than Av. Per Ct. of Influenza.	May.	34	3.6	*a*20.65	66.03	65.48	60	4.76	2.98	8.70	*a* 3.81	*a* 4.32	*a* 10.4	.922	.157	29.002
	Oct.	33	3.3	*a*20.16	*b*48.99	*b*48.64	*a* 69	*b* 3.16	1.98	9.70	3.19	3.71	7.8	*a*1.022	.215	*a*29.043
	Aug.	31	4.4	*a*20.65	70.70	70.38	*a* 72	6.06	3.79	7.89	2.90	2.87	5.9	.644	.121	*a*29.052
	Sept.	28	4.3	*a*21.17	61.71	61.19	*a* 69	4.72	2.95	8.73	*a* 3.73	3.60	8.1	.643	.129	*a*29.058
	June	23	3.9	18.43	69.79	69.44	67	5.60	3.50	8.18	3.53	3.87	8.3	.916	.136	29.983
	July.	14	5.5	*a*20.81	72.27	71.69	*a* 69	6.12	3.83	7.85	3.39	3.61	6.5	.549	.105	28.996

*, †, ‡, §, ‖, ¶, **. See foot-notes, with these marks, in Exhibit 12, on page 381.

a An exception to proposition 1, relative to influenza, on page 388. As regards average daily range of barometer there is, for 1880, no exception to proposition 1.

b An exception to proposition 2, relative to influenza, on this page.

DIAGRAM 5.—WEEKLY REPORTS OF DISEASES IN MICHIGAN, IN 1880.



Designed by Henry B. Baker.

MONTHS OF LEAST, AND MONTHS OF MOST SICKNESS.

In Diagram 5, page 390, the line of × × ×'s graphically represents for each month in the year 1880 the average reported prevalence of sickness from the twenty-six leading diseases tabulated in this article.* It may be seen that during the year this average varied only about six per cent, namely between 30 per cent in May and November, which thus appear to have been the most healthful months, and 36 per cent in August,—the month of most sickness. An idea of the specified causes of the increased sickness in August may be obtained by a study of the diagrams illustrating this article, especially Diagrams 1, page 308, 2, page 382, and 4, page 401, in which are represented the curves for diarrhea, cholera morbus, cholera infantum, and intermittent fever; but if one seeks the causes of the increase of sickness from these diseases which are named as the causes of the sickness which increased in that month, it is believed that at least some of them may be appreciated by a study of the diagrams illustrating the article immediately following this, on the principal meteorological conditions in Michigan in 1880, wherein one may see that the conditions which immediately preceded and accompanied this increase of sickness were those which have almost uniformly been found to have such relation, namely, high temperature, great absolute humidity, scanty ozone, slow movement of atmosphere, etc. Whether these are the only causes, remains to be ascertained; and although it is probable and almost certain that they are not, yet the evidence in this volume with that in previous volumes seems to show that for at least a large proportion of the sickness they are the controlling causes, and the sickness follows directly or indirectly as the case may be.

RELATIONS OF RHEUMATISM TO METEOROLOGICAL CONDITIONS.

Proposition 1.—That **more** than the average per cent of weekly reports stated the presence of Rheumatism in months when the Average Daily Range of Temperature, the Relative Humidity of the Atmosphere, the Ozone, the Average Velocity of the Wind, the Monthly and the Average Daily Range of the Barometer, and the Average Daily Pressure of the Atmosphere were **greater** than the average for the year; and **less** than the average per cent of reports stated the presence of Rheumatism in months when these conditions were **less** than the average for the year. In Exhibit 18, page 392, the letter *a* marks exceptions to this proposition for the year 1880.

Explanations of propositions 1 and 2, are given on page 387; and summaries of the evidence of the exhibit are given in Exhibits 24 and 25, near the close of this article.

The per cent of weekly reports stating presence of rheumatism in each month in 1880 is graphically represented in Diagram 5, page 390.

Proposition 2.—That **more** than the average per cent of weekly reports stated the presence of Rheumatism in months when the Average Daily Temperature, and the Absolute Humidity of the Atmosphere, were **less** than the average for the year; and **less** than the average per cent of reports stated the presence of Rheumatism in months when these conditions were **greater** than the average for the year. In Exhibit 18, page 392, the letter *b* marks exceptions to this proposition for the year 1880.

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* First line in Exhibit 7, page 309.

EXHIBIT 18.—RHEUMATISM.—*Per Cent of Weekly Reports of Diseases in Michigan, Stating Presence of Rheumatism, during the Year and during each month of the Year 1880, Compared with Coincident Meteorological Conditions Observed at the Office of the State Board of Health, Lansing, Michigan, which is near the center of the thickly-settled part of the State.**

Months in Order of Per Cent of Weekly Reports Stating Presence of Rheumatism. †	Per Cent of Weekly Reports Stating Presence of Rheumatism. †	Average Order of Prevalence when Present. †, ‡	Temperature, Degrees Fahr.			Humidity of Atmosphere. § Av. of Observations at 7 A. M., 2 P. M., and 9 P. M., Daily.		Vapor Inhaled and Exhaled.		Ozone,—Relative. Scale of 10 Degrees of Coloration.		Average Velocity of Wind, Miles per Hour,—By Registering Anemometer.	Pressure of Atmosphere. Inches of Mercury. (Reduced to 32° F.)		
				Mean.									Range of Barometer.		
			Av. Range during Day and following Night, by Registering Thermometers, Observed at 7 A. M.	Average of Daily Observations at 7 A. M., 2 P. M., and 9 P. M.	One fourth of (7 A. M. + 2 P. M. + 9 P. M. Observation.)	Relative Humidity or Per Cent of Saturation.	Absolute Humidity—Grains of Vapor in a Cubic Foot of Air.	Ounces (Troy) of Vapor Inhaled by One Person in 24 Hours. ‖	Ounces (Troy) of Vapor Exhaled from Air Passages in 24 Hours, in Excess of Vapor Inhaled. ¶	Day Observation—7 A. M. to 2 P. M.	Night Observation—9 P. M. to 7 A. M.		Monthly and for Year.	Av. Daily, from 7 A. M. to 7 A. M., by Observat'ns at 7 A. M., 2 P. M., and 9 P. M.	Average Pressure.
Year 1880..	71	4.6	**111°	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	1.514	.215	29.016
More than Av. Per Ct. of Rheumatism. Jan...	81	4.6	*a*17.10	37.10	36.81	75	2.22	1.39	10.29	*a* 2.90	*a* 3.16	11.0	1.174	.322	*a* 28.998
Feb...	80	4.7	*a*18.17	31.60	31.62	*a* 58	1.74	1.09	10.59	4.38	4.97	12.7	1.253	.316	*a* 28.973
Mar...	79	4.3	19.45	34.31	34.19	*a* 63	1.75	1.09	10.59	*a* 3.42	*a* 3.81	12.8	1.422	.314	29.042
Dec...	74	4.1	*a*10.74	21.80	21.65	78	1.30	0.81	10.87	4.55	5.26	*a* 7.4	1.370	.252	*a*29.011
Nov...	72	4.6	*a*15.33	29.17	28.78	72	1.67	1.01	10.64	4.33	5.60	*a* 8.6	1.014	.234	29.113
Average....	71	4 6	18.61	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	.990	.215	29.016
Less than Average Per Cent of Rheumatism. April.	70	4.2	*a*20.63	*b*47.50	*b*47.46	59	*b* 2.76	1.73	9.95	*a* 4.28	*a* 4.93	*a* 13.8	.954	*a* .282	28.916
May..	70	3.9	*a*20.65	66.03	65.48	60	4.76	2.98	8.70	*a* 3.81	*a* 4.32	*a* 10.4	.922	.157	29.002
June..	68	4.4	18.43	69.79	69.44	67	5.60	3.50	8.18	3.53	3.87	8.3	.916	.136	28.983
Oct....	66	4.8	*a*20.16	*b*48.99	*b*48.64	*a* 69	*b* 3.16	1.98	9.70	3.19	3.71	7.8	*a*1.022	.215	*a* 29.043
July..	63	5.4	*a*20.81	72.27	71.69	*a* 69	6.12	3.83	7.85	3.39	3.61	6.5	.549	.105	28.996
Aug..	61	5.7	*a*20.65	70.70	70.38	*a* 72	6.06	3.79	7.89	2.90	2.87	5.9	.644	.121	*a* 29.052
Sept...	61	5.1	*a*21.17	61.71	61.19	*a* 69	4.72	2.95	8.73	*a* 3.73	3.60	8.1	.643	.129	*a* 29.058

*, †, ‡, ‖, §, ¶, ** See foot-notes with these marks, in Exhibit 12, page 381.
a An exception to proposition 1, relative to rheumatism, on page 391.
b An exception to proposition 2, relative to rheumatism, on page 391.

RELATIONS OF NEURALGIA TO METEOROLOGICAL CONDITIONS.

PROPOSITION 1.—That **more** than the average per cent of weekly reports stated the presence of neuralgia in months when the average daily range of temperature, the relative humidity of the atmosphere, the ozone, the average velocity of the wind, the monthly and the average daily range of the barometer, and the average daily pressure of the atmosphere were **greater** than the average for the year; and **less** than the average per cent of reports stated the presence of neuralgia in the months when these conditions were **less** than the average for the year. In Exhibit 19, page 393, the letter *a* marks exceptions to this proposition for the year 1880.

Explanations of propositions 1 and 2, are given on page 387; and summaries

of the evidence of the exhibit are given in Exhibits 24 and 25, near the close of this article.

PROPOSITION 2.—That more than the average per cent of weekly reports stated the presence of neuralgia in months when the average daily temperature, and the absolute humidity of the atmosphere, were less than the average for the year; and less than the average per cent of reports stated the presence of neuralgia in months when these conditions were greater than the average for the year. In Exhibit 19, below, there is no exception to this proposition for the year 1880.

The per cent of weekly reports stating presence of neuralgia in each month in 1880 is graphically represented in Diagram 5, page 390.

EXHIBIT 19.—NEURALGIA.—*Per Cent of Weekly Reports of Diseases in Michigan Stating Presence of Neuralgia, during the Year and during each Month of the Year 1880, Compared with Coincident Meteorological Conditions, Observed and Recorded at the Office of the State Board of Health, Lansing, Michigan, which is near the center of the thickly-settled part of the State.* *

				TEMPERATURE, Degrees Fahr.			HUMIDITY OF ATMOSPHERE. § Av. of Observations at 7 A. M., 2 P. M., and 9 P. M. Daily.		VAPOR INHALED AND EXHALED.		OZONE,—RELATIVE. Scale of 10 Degrees of Coloration.			PRESSURE OF ATMOSPHERE. Inches of Mercury. (Reduced to 32 F.)		
					MEAN.									RANGE OF BAROMETER.		
MONTHS IN ORDER OF PER CENT OF WEEKLY REPORTS STATING PRESENCE OF NEURALGIA.†		Per Cent of Weekly Reports Stating Presence of Neuralgia.†	Av. Order of Prevalence where Present.†, ‡	Av. Range during Day and following Night, by Registering Thermometers, Observed at 7 A. M.	Average of Daily Observations at 7 A. M., 2 P. M., and 9 P. M.	One-fourth of (7 A. M. + 2 P. M. + twice 9 P. M. Observation.)	Relative Humidity or Per Cent of Saturation.	Absolute Humidity—Grains of Vapor in a Cubic Foot of Air.	Ounces (Troy) of Vapor Inhaled by One Person in 24 Hours.‖	Ounces (Troy) of Vapor Exhaled from Air Passages in 24 Hours, in Excess of Vapor Inhaled. ¶	Day Observation,—7 A. M. to 2 P. M.	Night Observation,—9 P. M. to 7 A. M.	Average Velocity of the Wind, Miles Per Hour,—by Registering Anemometer.	Monthly, and for Year.	Av. Daily, from 7 A. M. to 7 A. M., by Observations at 7 A. M., 2 P. M., and 9 P. M.	Average Pressure.
Year 1880..		64	4.5	**111°	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	1.514	.215	29.016
More than Average Per Cent of Neuralgia.	Mar..	75	4.2	19.45	34.34	34.19	a 63	1.75	1.09	10.59	a 3.42	a 3.81	12.8	1.422	.314	29.042
	Jan...	70	4.3	a17.10	37.10	36.81	75	2.22	1.39	10.29	a 2.90	a 3.16	11.0	1.174	.322	a 28.998
	Feb...	70	4.5	a18.17	31.60	31.62	a 58	1.74	1.09	10.59	4.38	4.97	12.7	1.253	.316	a 28.973
	April.	69	4.4	20.63	47.50	47.46	a 59	2.76	1.73	9.95	4.28	4.93	13.8	a .954	.282	a 28.916
	Dec...	69	3.9	a10.74	21.80	21.65	78	1.30	0.81	10.87	4.55	5.26	a 7.4	1.370	.252	a 29.011
	Nov...	65	4.4	a15.33	29.17	28.78	72	1.67	1.04	10.64	4.33	5.60	a 8.6	1.014	.234	29.113
	Oct...	64	4.5	20.16	48.99	48.64	69	3.16	1.98	9.70	a 3.19	a 3.71	a 7.8	1.022	.215	29.043
Average....		64	4.5	18.61	b49.25	b48.94	68	b 3.49	2.18	9.50	3.70	4.14	9.4	.990	.215	29.016
Less than Av. Per Cent of Neuralgia.	May..	63	4.0	a20.65	66.03	65.48	60	4.76	2.98	8.70	a 3.81	a 4.32	a 10.4	.922	.157	29.002
	June..	61	4.2	18.43	69.79	69.44	67	5.60	3.50	8.18	3.53	3.87	8.3	.916	.136	28.983
	Aug...	53	5.4	a20.65	70.70	70.38	a 72	6.06	3.79	7.89	2.90	2.87	5.9	.644	.121	a 29.052
	July..	53	5.1	a20.81	72.27	71.69	a 69	6.12	3.83	7.85	3.39	3.61	6.5	.549	.105	28.996
	Sept...	50	4.8	a21.17	61.71	61.19	a 69	4.72	2.95	8.73	a 3.73	3.60	8.1	.643	.129	a 29.058

*, †, ‡, §, ‖, ¶, **. See footnotes with these marks, in Exhibit 12, page 381.

a An exception to proposition 1, relative to neuralgia, on page 392.

b For 1880 there is no exception to proposition 2, relative to neuralgia, on this page.

RELATIONS OF PULMONARY CONSUMPTION TO METEOROLOGICAL CONDITIONS.

PROPOSITION 1.—That **more** than the average per cent of weekly reports stated the presence of pulmonary consumption in months when the Average Daily Range of Temperature, the Relative Humidity of the Atmosphere, the Ozone, the Average Velocity of the Wind, the Monthly and the Average Daily Range of the Barometer, and the Average Daily Pressure of the Atmosphere were **greater** than the average for the year; and **less** than the average per cent of the reports stated the presence of pulmonary consumption in months when these conditions were **less** than the average for the year. In Exhibit 20, below, the letter *a* marks exceptions to this proposition for the year 1880.

EXHIBIT 20.—CONSUMPTION.—*Per Cent of Weekly Reports of Diseases in Michigan, Stating Presence of Pulmonary Consumption during the Year and during each Month of the Year 1880, Compared with some given Meteorological Conditions at the same time, as observed and recorded at the Office of the State Board of Health, Lansing, Michigan, which is near the center of the thickly-settled part of the State.**

Months in Order of Per Cent of Weekly Reports stating Presence of Pulmonary Consumption.†		Per Cent of Weekly Reports Stating Presence of Pulmonary Consumption.†	Av. Order of Prevalence where Present.†, ‡	Temperature, Degrees Fahr.			Humidity of Atmosphere.§ Av. of Observations at 7 A. M., 2 P. M., and 9 P. M., Daily.		Vapor Inhaled and Exhaled.		Ozone,—Relative. Scale of 10 Degrees of Coloration.		Av. Velocity of the Wind,—Miles per Hour,—by Registering Anemometer.‖	Pressure of Atmosphere. Inches of Mercury. (Reduced to 32° F.)		
					Mean.									Range of Barometer.		
				Av. Range during Day and following Night, by Registering Thermometers,—Observed at 7 A. M.	Av. of Daily Observations at 7 A. M., 2 P. M., and 9 P. M.	One-fourth of (7 A. M. + 2 P. M. + twice 9 P. M. observation.)	Relative Humidity, or Per Cent of Saturation.	Absolute Humidity—Grs. of Vapor in a Cubic Foot of Air.	Ounces (Troy) of Vapor Inhaled by one Person in 24 Hours.	Ounces (Troy) of Vapor Exhaled from Air Passages in 24 Hours, in Excess of Vapor Inhaled.¶	Day Observation,—7 A. M. to 2 P. M.	Night Observation,—9 P. M. to 7 A. M.		Monthly, and for Year.	Av. Daily, from 7 A. M. to 7 A. M., by Observations at 7 A. M., 2 P. M., and 9 P. M.	Average Pressure.
YEAR 1880.		68	5.7	**111°	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	1.514	.215	29.016
More than Av. Per Ct. of Consumption.	Apr.	72	5.6	20.63	47.50	47.46	*a* 59	2.76	1.73	9.95	4.28	4.93	13.8	*a* .954	.282	*a*28.916
	Dec.	70	5.4	*a*10.74	21.80	21.65	78	1.30	0.81	10.87	4.55	5,26	*a* 7.4	1.370	.252	*a*29.011
	Mar.	70	5.6	19.45	31.34	34.19	*a* 63	1.75	1.09	10.59	*a* 3.42	*a* 3.81	12.8	1.422	.314	29.042
	May.	70	5.4	20.65	*b*66.03	*b*65.48	*a* 60	*b* 4.76	2.98	8.70	3.81	4.32	10.4	*a* .922	*a* .157	*a*29.002
	June	69	5.5	*a*18.43	*b*69.79	*b*69.44	*a* 67	*b* 5.60	3.50	8.18	*a* 3.53	*a* 3.87	*a* 8.3	*a* .916	*a* .136	*a*28.983
	Feb.	69	5.9	*a*18.17	31.60	31.62	*a* 58	1.74	1.09	10.59	4.38	4.97	12.7	1.253	.316	*a*28.973
	Nov.	68	5.6	*a*15.33	29.17	28.78	72	1.67	1.04	10.64	4.33	5.60	*a* 8.6	1.014	.234	29.113
Average.		68	5.7	18.61	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	.990	.215	29.016
Less than Av. Consumption.	Oct.	66	5.4	*a*20.16	*b*48.99	*b*48.64	*a* 69	*b* 3.16	1.98	9.70	3.19	3 71	7.8	*a*1.022	.215	*a*29.043
	July.	66	6.0	*a*20.81	72.27	71.69	*a* 69	6.12	3.83	7.85	3.39	3.61	6.5	.549	.105	28.996
	Sept.	66	6.0	*a*21.17	61.71	61.19	*a* 69	4.72	2.95	8.73	*a* 3.73	3.60	8.1	.643	.129	*a*29.058
	Jan.	65	5.6	17.10	*b*37.10	*b*36.81	*a* 75	*b* 2.22	1.39	10.29	2.90	3.16	*a* 11.0	*a*1.174	*a* .322	28.998
	Aug.	62	6.5	*a*20.65	70.70	70.38	*a* 72	6.06	3.79	7.89	2.90	2.87	5.9	.644	.121	*a*29.052

*, †, ‡, §, ‖, ¶, **. See foot-notes with these marks, in Exhibit 12, page 381.
a An exception to proposition 1, relative to consumption, on this page.
b An exception to proposition 2, relative to consumption, on page opposite this.

Explanations of propositions 1 and 2 are given on page 387; and summaries of the evidence of the exhibit are given in Exhibits 24 and 25, near the close of this article.

PROPOSITION 2.—That **more** than the average per cent of weekly reports stated the presence of pulmonary consumption in months when the Average Daily Temperature and the Absolute Humidity of the Atmosphere were **less** than the average for the year; and **less** than the average per cent of reports stated the presence of pulmonary consumption in months when these conditions were **greater** than the average for the year. In Exhibit 20, opposite this page, the letter *b* marks exceptions to this proposition for the year 1880.

What per cent of the weekly reports stated the presence of pulmonary consumption in each month in 1880, is graphically represented in Diagram 5, page 390.

RELATIONS OF DIARRHEA TO METEOROLOGICAL CONDITIONS.

PROPOSITION 1.—That **more** than the average per cent of weekly reports stated the presence of Diarrhea in months when the average daily range of temperature, the average daily temperature, the absolute humidity of the atmosphere, the monthly and the average daily range of the barometer, and the average daily pressure of the atmosphere were **greater** than the average for the year; and **less** than the average per cent of reports stated the presence of diarrhea in months when these conditions were **less** than the average for the year. In Exhibit 21, page 396, the letter *a* marks exceptions to this proposition for the year 1880.

Explanations of propositions 1 and 2 are given on page 387; and summaries of the evidence of the exhibit are given in Exhibits 24 and 25, near the close of this article.

PROPOSITION 2.—That **more** than the average per cent of weekly reports stated the presence of diarrhea in months when the relative humidity of the atmosphere, the ozone, and the average velocity of the wind were **less** than the average for the year; and **less** than the average per cent of reports stated the presence of diarrhea in months when these conditions were **greater** than the average for the year. In Exhibit 21, page 396, the letter *b* marks exceptions to this proposition for the year 1880.

In Diagram 1, page 308, is graphically represented by months what per cent of the weekly reports in each month in 1880 stated the presence of diarrhea.

PROPOSITION 3.—For those months which are not, as regards the absolute humidity of the atmosphere, exceptions to proposition 1, it is true also that the quantity of vapor inhaled daily was **greater** than the average, and the quantity exhaled daily in excess of that inhaled was **less** than the average, in months when **more** than the average per cent of reports stated presence of diarrhea; and that **less** vapor was inhaled and a **greater** excess exhaled daily in months when the per cent of reports stating presence of diarrhea was **less** than the average.

Proposition 3 is true also in relation to cholera infantum and intermittent fever, treated in Exhibits 22 and 23, pages 397 and 398.

Inasmuch as the temperature of the human body is very greatly influenced by the air inhaled, and thus depends greatly upon the qualities of the atmosphere, especially upon its humidity, and as these diseases all seem to prevail most in hot climates, the evidence relative to proposition 3 is of very great interest, because of its important bearing in the study of the causation of these diseases.

EXHIBIT 21.—DIARRHEA.—*Per Cent of Weekly Reports of Diseases in Michigan, Stating Presence of Diarrhea during the Year and during each Month of the Year 1880, Compared with Coincident Meteorological Conditions observed at the Office of the State Board of Health, Lansing, Michigan, which is near the center of the thickly-settled part of the State.**

Months in Order of Per Cent of Weekly Reports Stating Presence of Diarrhea.†		Per Cent of Weekly Reports Stating Presence of Diarrhea.†	Average Order of Prevalence where Present.†, ‡.	Temperature, Degrees Fahr.			Humidity of Atmosphere.§ Av. of Observations at 7 A. M., 2 P. M., and 9 P. M., Daily.		Vapor Inhaled and Exhaled.		Ozone—Relative. Scale of 10 Degrees of Coloration.		Average Velocity of Wind,—Miles per Hour,—By Registering Anemometer.	Pressure of Atmosphere. Inches of Mercury. (Reduced to 32° F.)		
					Mean.									Range of Barometer.		
				Av. Range during Day and following Night, by Registering Thermometers,—Observed at 7 A. M.	Average of Daily Observations at 7 A. M., 2 P. M., and 9 P. M.	One-fourth of (7 A. M. + 2 P. M. + twice 9 P. M. Observation.)	Relative Humidity, or Per Cent of Saturation.	Absolute Humidity,—Grains of Vapor in a Cubic foot of Air.	Ounces (Troy) of Vapor Inhaled by one Person in 24 Hours.‖	Ounces (Troy) of Vapor Exhaled from Air Passages in 24 Hours in Excess of Vapor Inhaled.¶	Day Observation,—7 A. M. to 2 P. M.	Night Observation,—9 P. M. to 7 A. M.		Monthly, and for Year.	Av. Daily, from 7 A. M. to 7 A. M., by Observations at 7 A. M., 2 P. M., and 9 P. M.	Average Pressure.
Year 1880		47	4.2	**111°	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	1.514	0.215	29.016
More than Av. Per Cent of Diarrhea.	Aug.	93	2.5	20.65	70.70	70.38	*b* 72	6.06	3.79	7.89	2.90	2.87	5.9	*a* .644	*a* .121	29.052
	July.	91	2.5	20.81	72.27	71.69	*b* 69	6.12	3.83	7.85	3.39	3 61	6.5	*a* .549	*a* .105	*a* 28.996
	Sept.	82	3.3	21.17	61.71	61.19	*b* 69	4.72	2.95	8.73	*b* 3.73	3.60	8.1	*a* .643	*a* .129	29.058
	June.	56	4.0	*a*18.43	69.79	69.44	67	5.60	3.50	8.18	3 53	3.87	8.3	*a* .916	*a* .136	*a* 28.983
	Oct.	50	4.3	20.16	*a*48.99	*a*48.64	*b* 69	*a* 3.16	1.98	9.70	3.19	3.71	7.8	1.022	*a* .215	29.043
Average		47	4.2	18.61	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	.990	.215	29.016
Less than Average Per Cent of Diarrhea.	May.	40	4.9	*a*20.65	*a*66.03	*a*65.48	*b* 60	*a* 4.76	2.98	8.70	3.81	4.32	10.4	.922	.157	29.002
	April.	28	5.7	*a*20.63	47.50	47.46	*b* 59	2.76	1.73	9.95	4 28	4.93	13.8	.954	*a* .282	28.916
	Nov.	27	5.2	15.33	29.17	28.78	72	1.67	1.04	10.64	4.33	5.60	*b* 8.6	*a*1.014	*a* .234	*a* 29.113
	Jan.	25	5.9	17.10	37.10	36.81	75	2.22	1.39	10.29	*b* 2.90	*b* 3.16	11.0	*a*1.174	*a* .322	28.998
	Mar.	25	5.9	*a*19.45	34.34	34.19	*b* 63	1.75	1.09	10.59	*b* 3.42	*b* 3.81	12.8	*a*1.422	*a* .314	*a* 29.042
	Dec.	24	5.2	10.74	21.80	21.65	78	1.30	0.81	10.87	4.55	5.26	*b* 7.4	*a*1.370	*a* .252	29.011
	Feb.	23	6.4	18.17	31.60	31.62	*b* 58	1.74	1.09	10.59	4.38	4.97	12.7	*a*1.253	*a* .316	28.973

*, †, ‡, §, ‖, ¶, **. See foot-notes, with these marks, in Exhibit 12, page 381.
a An exception to proposition 1, relative to diarrhea, on page 395.
b An exception to proposition 2, relative to diarrhea, on page 395.

RELATIONS OF CHOLERA INFANTUM TO METEOROLOGICAL CONDITIONS.

PROPOSITION 1.—That **more** than the average per cent of weekly reports stated the presence of Cholera Infantum in months when the average daily range of temperature, the average daily temperature, the absolute humidity of the atmosphere, the monthly and the average daily range of the barometer, and the average daily pressure of the atmosphere were **greater** than the average for the year; and **less** than the average per cent of reports stated the presence of Cholera Infantum in months when these conditions were **less** than the average for the year. In Exhibit 22, page 397, the letter *a* marks exceptions to this proposition for the year 1880.

Explanations of propositions 1 and 2 are given on page 387; and summaries

of the evidence of the exhibit are given in Exhibits 24 and 25, near the close of this article.

PROPOSITION 2.—That **more** than the average per cent of weekly reports stated the presence of Cholera Infantum in months when the relative humidity of the atmosphere, the ozone, and the average velocity of the wind were **less** than the average for the year, and **less** than the average per cent of reports stated the presence of Cholera Infantum in months when these conditions were **greater** than the average for the year. In Exhibit 22, below, the letter *b* marks exceptions to this proposition for the year 1880.

What per cent of all the weekly reports of sickness in each month in 1880 stated presence of cholera infantum is graphically represented by months in Diagram 2, page 382.

EXHIBIT 22.—CHOLERA INFANTUM.—*Per Cent of Weekly Reports of Diseases in Michigan, Stating Presence of Cholera Infantum during the Year and during each Month of the Year 1880, Compared with Coincident Meteorological Conditions observed at the Office of the State Board of Health, Lansing, Michigan, which is near the center of the thickly-settled part of the State.**

MONTHS IN ORDER OF PER CENT OF WEEKLY REPORTS STATING PRESENCE OF CHOLERA INFANTUM.†	Per Cent of Weekly Reports Stating Presence of Cholera Infantum.†	Av. Order of Prevalence where Present. †, ‡	TEMPERATURE, Degrees Fahr.			HUMIDITY OF ATMOSPHERE.§ Av. of Observations at 7 A. M., 2 P. M., and 9 P. M., Daily.		VAPOR INHALED AND EXHALED.		OZONE,—RELATIVE. Scale of 10 Degrees of Coloration.		Av. Velocity of the Wind, Miles per Hour,—By Robinson's Registering Anemometer.	PRESSURE OF ATMOSPHERE. Inches of Mercury. (Reduced to 32° F.)		
				MEAN.									RANGE OF BAROMETER.		
			Av. Range during Day and following Night, by Registering Thermometers,—Observed at 7 A. M.	Av. of Daily Observations at 7 A. M., 2 P. M., and 9 P. M.	One-fourth of (7 A. M. + 2 P. M. + twice 9 P. M. observation.)	Relative Humidity, or Per Cent of Saturation.	Absolute Humidity—Grs. of Vapor in a Cubic Foot of Air.	Ounces (Troy) of Vapor Inhaled by one Person in 24 Hours.‖	Ounces (Troy) of Vapor Exhaled from Air Passages in 24 Hours, in Excess of Vapor Inhaled.¶	Day Observation,—7 A. M. to 2 P. M.	Night Observation,—9 P. M. to 7 A. M.		Monthly, and for Year.	Av. Daily, from 7 A. M. to 7 A. M., by Observations at 7 A. M., 2 P. M., and 9 P. M.	Average Pressure.
YEAR 1880.	14	5.2	**111°	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	1.514	.215	29.016
More than Av. Per Cent. Aug.	52	4.5	20.65	70.70	70.38	*b* 72	6.06	3.79	7.89	2.96	2.87	5.9	*a* .644	*a* .121	29.052
July.	48	4.6	20.81	72.27	71.69	*b* 69	6.12	3.83	7.85	3.39	3.61	6.5	*a* .549	*a* .105	*a*28.996
Sept.	33	5.7	21.17	61.71	61.19	*b* 69	4.72	2.95	8.73	*b* 3.73	3.60	8.1	*a* .643	*a* .129	29.058
June	14	6.2	*a*18.43	69.79	69.44	67	5.60	3.50	8.18	3.53	3.87	8.3	*a* .916	*a* .136	*a*28.983
Average.	14	5.2	18.61	49.25	48.94	68	3.49	2.18	9.50	3.70	4.15	9.4	.990	.215	29.016
Less than the Av. Per Cent of Cholera Infantum. Oct.	9	5.8	*a*20.16	48.99	48.64	69	3.16	1.98	9.70	*b* 3.19	*b* 3.71	*b* 7.8	*a*1.022	.215	*a*29.043
Nov.	4	8.0	15.33	29.17	28.78	72	1.67	1.04	10.64	4.33	5.60	*b* 8.6	*a*1.014	*a* .234	*a*29.113
May.	2	6.3	*a*20.65	*a*66.03	*a*65.48	*b* 60	*a* 4.76	2.98	8.70	3.81	4.32	10.4	.922	.157	29.002
Dec.	2	6.0	10.74	21.80	21.65	78	1.30	0.81	10.87	4.55	5.26	*b* 7.4	*a*1.370	*a* .252	29.011
Jan.	2	4.3	17.10	37.10	36.81	75	2.22	1.39	10.29	*b* 2.90	*b* 3.16	11.0	*a*1.174	*a* .322	28.998
Mar.	1	6.0	*a*19.45	34.34	34.19	*b* 63	1.75	1.09	10.59	*b* 3.42	*b* 3.81	12.8	*a*1.422	*a* .314	*a*29.042
Apr.	0.3	7.0	*a*20.63	47.50	47.46	*b* 59	2.76	1.73	9.95	4.28	4.93	13.8	*a*1.954	*a*.282	28.916
Feb.	0.3	4.0	18.17	31.60	31.62	*b* 58	1.74	1.09	10.59	4.38	4.97	12.7	*a*1.253	*a* .316	28.973

*, †, ‡, §, ‖, ¶, **. See foot-notes with these marks, in Exhibit 12, page 381.
a An exception to proposition 1, relative to cholera infantum, on page opposite this.
b An exception to proposition 2, relative to cholera infantum, on this page.

RELATIONS OF INTERMITTENT FEVER TO METEOROLOGICAL CONDITIONS.

PROPOSITION 1.—That **more** than the average per cent of weekly reports stated the presence of intermittent fever in months when the average daily range of temperature, the average daily temperature, the absolute humidity of the atmosphere, the monthly and the average daily range of the barometer, and the average daily pressure of the atmosphere, were **greater** than the average for the year; and **less** than the average per cent of reports stated the presence of intermittent fever in months when these conditions were **less** than the average for the year. In Exhibit 23, below, the letter *a* marks exceptions to this proposition for the year 1880.

EXHIBIT 23.—INTERMITTENT FEVER.—*Per Cent of Weekly Reports of Diseases in Michigan, Stating Presence of Intermittent Fever, during the Year and during each Month of the Year 1880, Compared with Coincident Meteorological Conditions observed at the Office of the State Board of Health, Lansing, Mich., which is near the center of the thickly-settled part of the State.**

Months in Order of Per Cent of Weekly Reports stating Presence of Intermittent Fever. †		Per Cent of Weekly Reports Stating Presence of Intermittent Fever. †	Av. Order of Prevalence where Present. †, ‡	Temperature, Degrees Fahr.			Humidity of Atmosphere.§ Av. of Observations at 7 A. M., 2 P. M., and 9 P. M., Daily.		Vapor Inhaled and Exhaled.		Ozone,—Relative. Scale of 10 Degrees of Coloration.		Average Velocity of Wind, Miles per Hour,—By Registering Anemometer.	Pressure of Atmosphere. Inches of Mercury. (Reduced to 32° F.)		
					Mean.									Range of Barometer.		
				Av. Range during Day and following Night, by Registering Thermometers,—Observed at 7 A. M.	Av. of Daily Observations, at 7 A. M., 2 P. M., and 9 P. M.	One-fourth of (7 A. M.+2 P. M.+twice 9 P. M. observation.)	Relative Humidity, or Per Cent of Saturation.	Absolute Humidity—Grs. of Vapor in a Cubic Foot of Air.	Ounces (Troy) of Vapor Inhaled by one Person in 24 Hours.‖	Ounces (Troy) of Vapor Exhaled from Air Passages in 24 Hours, in Excess of Vapor Inhaled. ¶	Day Observation,—7 A. M. to 2 P. M.	Night Observation,—9 P. M. to 7 A. M.		Monthly, and for Year.	Av. Daily, from 7 A. M. to 7 A. M., by Observations at 7 A. M., 2 P. M., and 9 P. M.	Average Pressure.
YEAR 1880.		82	2.3	**111°	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	1.514	.215	29.016
More than Av. Per Ct. of Intermittent Fever.	Sept.	93	1.5	21.17	61.71	61.19	*b* 69	4.72	2.95	8.73	*b* 3.73	3.60	8.1	*a* .643	*a* .129	29.058
	July.	92	1.8	20.81	72.27	71.69	*b* 69	6.12	3.83	7.85	3.39	3.61	6.5	*a* .549	*a* .105	*a*28.996
	Aug.	91	1.9	20.65	70.70	70.38	*b* 72	6.06	3.79	7.89	2.90	2.87	5.9	*a* .644	*a* .121	29.052
	June	91	1.5	*a*18.43	69.79	69.44	67	5.60	3.50	8.18	3.53	3.87	8.3	*a* .916	*a* .136	*a*28.983
	May.	90	1.8	20.65	66.03	65.48	60	4.76	2.98	8.70	*b*3.81	*b* 4.32	*b* 10.4	*a* .922	*a* .157	*a*29.002
	Oct.	90	1.6	20.16	*a*48.99	*a*48.61	*b* 69	*a* 3.16	1.98	9.70	3.19	3.71	7.8	1.022	*a* .215	29.043
Average.		82	2.3	18.61	49.25	48.94	68	3.49	2.18	9.50	3.70	4.14	9.4	.990	.215	29.016
Less than Av. Per Ct. of Intermittent Fever.	Nov.	79	2.2	15.33	29.17	28.78	72	1.67	1.04	10.64	4.33	5.60	*b* 8.6	*a*1.014	*a* .234	*a*29.113
	Apr.	79	2.4	*a*20.63	47.50	47.46	*b* 59	2.76	1.73	9.95	4.28	4.93	13.8	.954	*a* .282	28.916
	Mar.	71	3.1	*a*19.45	34.34	34.19	*b* 63	1.75	1.09	10.59	*b* 3.42	*b* 3.81	12.8	*a*1.422	*a* .314	*a*29.042
	Dec.	71	2.8	10.74	21.80	21.65	78	1.30	0.81	10.87	4.55	5.20	*b* 7.4	*a*1.370	*a* .252	29.011
	Feb.	69	3.6	18.17	31.60	31.62	*b* 58	1.74	1.09	10.59	4.38	4.97	12.7	*a*1.253	*a* .316	28.973
	Jan.	68	3.4	17.10	37.10	36.81	75	2.22	1.39	10.29	*b* 2.90	*b* 3.16	11.0	*a*1.174	*a* .322	28.998

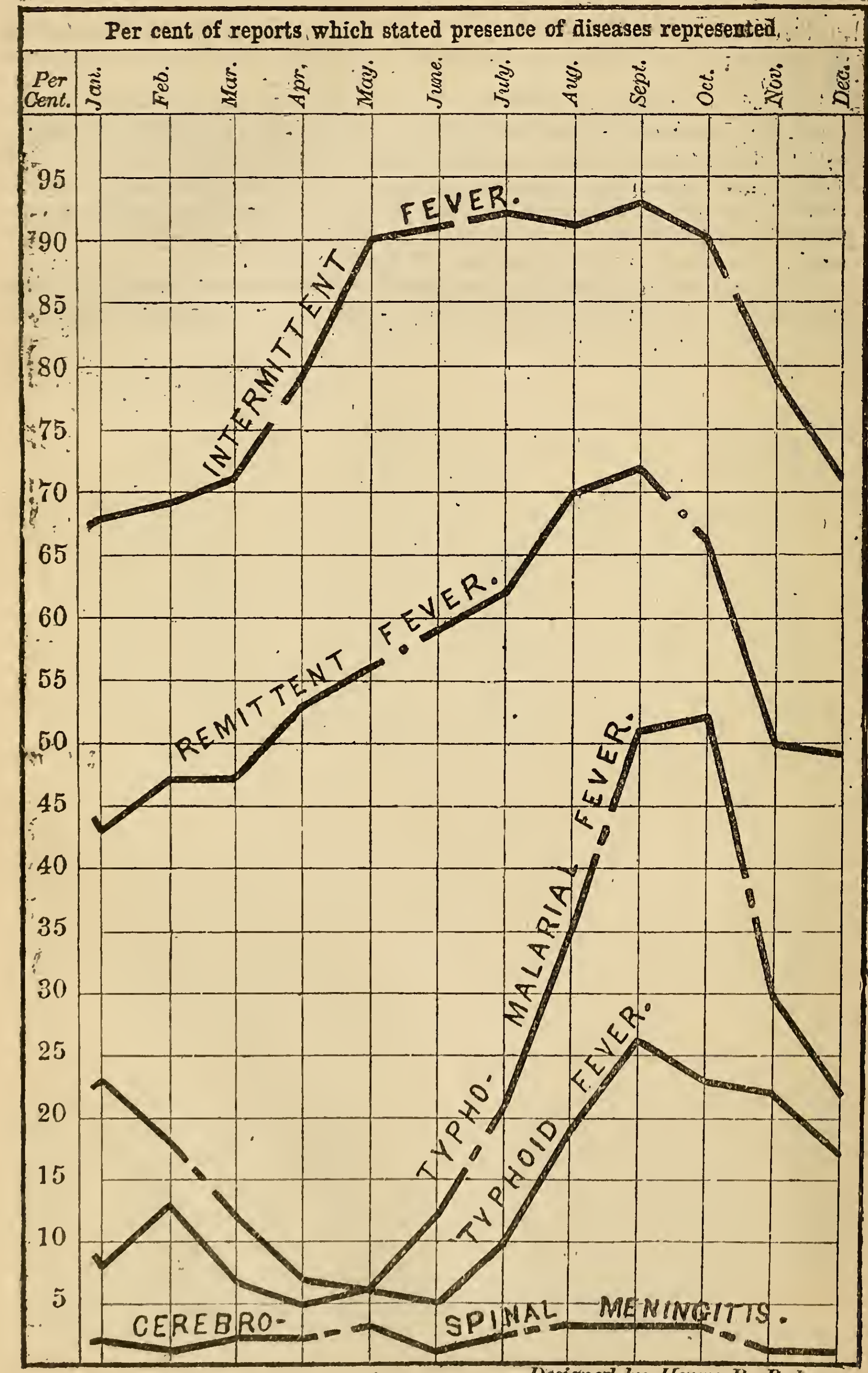
*, †, ‡, §, ‖, ¶, **. See foot-notes with these marks, in Exhibit 12, page 381.
a Exceptions to proposition 1, relative to intermittent fever, on this page.
b Exceptions to proposition 2, relative to intermittent fever, on page opposite this.

Explanations of propositions 1 and 2 are given on page 387; and summaries of the evidence of the exhibit are given in Exhibits 24 and 25, near the close of this article.

Proposition 2.—That **more** than the average per cent of weekly reports stated the presence of intermittent fever in months when the relative humidity of the atmosphere, the ozone, and the average velocity of the wind were **less** than the average for the year; and **less** than the average per cent of reports stated the presence of intermittent fever in months when these conditions were **greater** than the average for the year. In Exhibit 23, page 398, the letter *b* marks exceptions to this proposition for the year 1880.

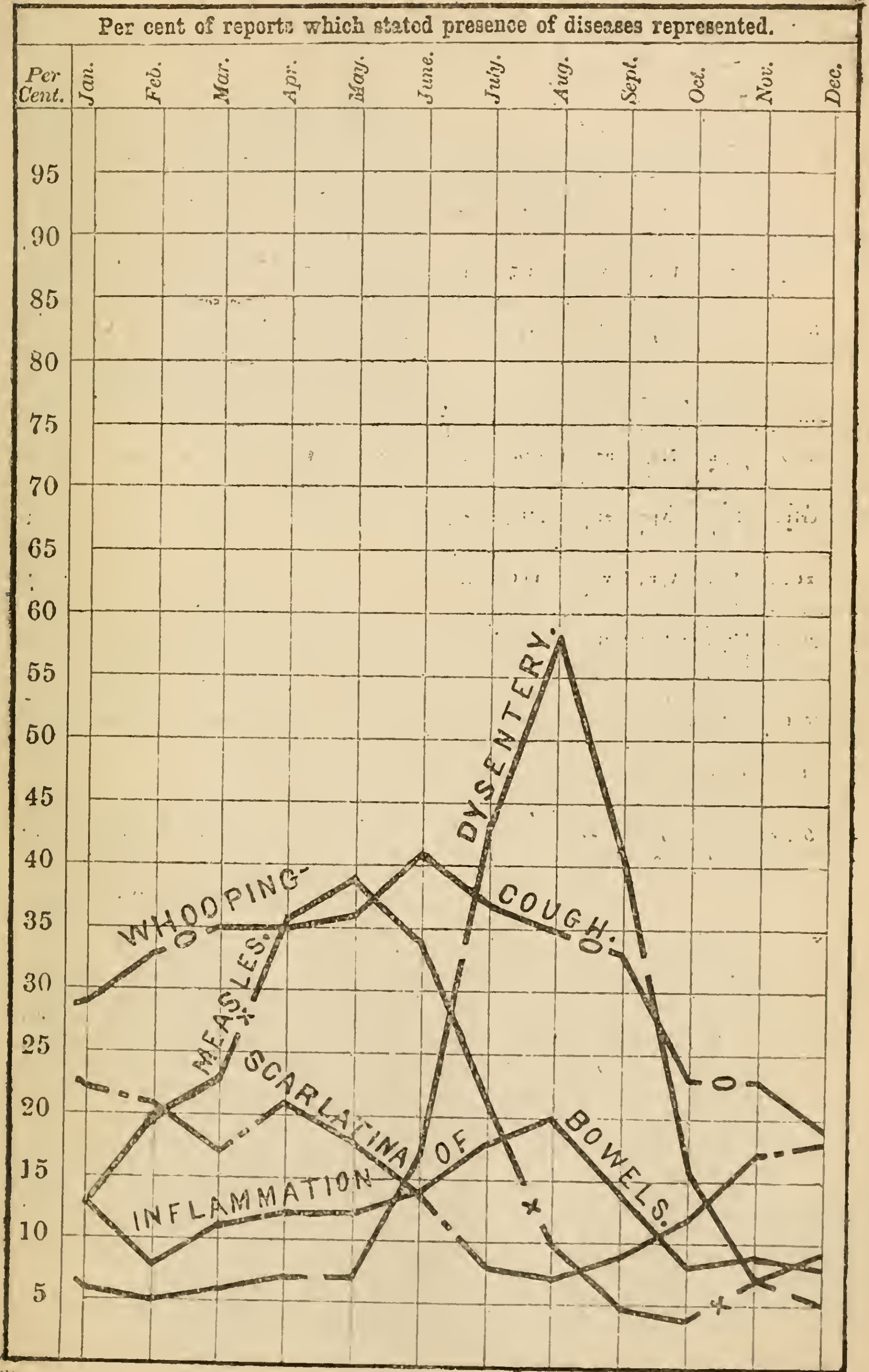
What per cent of the weekly reports received in 1880 stated presence of intermittent fever is graphically represented by months in Diagram 3, page 400.

DIAGRAM 3.—WEEKLY REPORTS OF DISEASES IN MICHIGAN, IN 1880.



Designed by Henry B. Baker.

DIAGRAM 4.—WEEKLY REPORTS OF DISEASES IN MICHIGAN, IN 1880.



Designed by Henry B. Baker.

EXHIBIT 24.—*Summary relative to Propositions contained in Exhibits 12–20 (pages 381–395), concerning Relations, by Months in 1880, between Greater or Less than usual Prevalence of Diseases named and certain given coincident Climatic Conditions.*

DISEASES.	MONTHS (INCLUSIVE) IN WHICH DISEASES NAMED WERE MORE THAN USUALLY PREVALENT, IN 1880.	MONTHS (INCLUSIVE) IN WHICH DISEASES NAMED WERE LESS THAN USUALLY PREVALENT, IN 1880.	FOR THE 12 MONTHS OF THE YEAR 1880, NUMBER OF MONTHS IN WHICH PROPOSITIONS HOLD TRUE.						
			That Diseases named were More Prevalent than usual when the Av. Temp. and Absolute Humidity were Lower than usual, and Less Prevalent when these conditions were Higher than usual.		That Diseases named were More Prevalent than usual when the Relative Humidity, Ozone, Velocity of Wind, and Average Daily Range of Barometer were Greater than usual, and Less Prevalent than usual when these conditions were Lower than usual.				
			For Average Temperature.	For Absolute Humidity.	For Relative Humidity.	For Ozone.		For Velocity of Wind.	For Average Daily Range of Barometer.
						Day.	Night.		
Bronchitis	Jan. to Apr., Nov., Dec.	May to Oct.	11	11	5	8	9	9	12
Pneumonia	Jan. to May, Dec.	June to Nov.	9	9	3	8	9	11	10
Membranous Croup.	Jan. to Apr., Oct. to Dec.	May to Sept.	12	12	6	7	8	8	11
Diphtheria	Feb. to Apr., Oct. to Dec.	Jan., May to Sept.	11	11	5	8	9	7	10
Tonsilitis	Jan. to Mar., Nov., Dec.	April to Oct.	10	10	6	7	8	8	11
Influenza	Jan. to Apr., Nov., Dec.	May to Oct.	11	11	5	8	9	9	12
Rheumatism	Jan. to Mar., Nov., Dec.	April to Oct.	10	10	6	7	8	8	11
Neuralgia	Jan. to Apr., Oct. to Dec.	May to Sept.	12	12	6	7	8	8	11
Pulmonary Consumption	Feb. to June, Nov., Dec.	Jan., July to Oct.	8	8	2	9	10	8	9

How closely related to climatic conditions were several of the cold-weather diseases is shown in the summary—Exhibit 24; and a similar summary relating to some of the warm-weather diseases is given in Exhibit 25.

EXHIBIT 25.—*Summary relative to Propositions contained in Exhibits 21–23 (pages 395–9), concerning Relations, by Months in 1880, between Greater or less than Usual Prevalence of Diseases named and certain given coincident Climatic Conditions.*

DISEASES.	MONTHS (INCLUSIVE) IN WHICH DISEASES NAMED WERE MORE THAN USUALLY PREVALENT, IN 1880.	MONTHS (INCLUSIVE) IN WHICH DISEASES NAMED WERE LESS THAN USUALLY PREVALENT, IN 1880.	FOR THE 12 MONTHS OF THE YEAR 1880, NUMBER OF MONTHS IN WHICH PROPOSITIONS HOLD TRUE.					
			That Diseases named were More Prevalent than usual when the Av. Temp. and Absolute Humidity were Higher than usual, and Less Prevalent when these conditions were Lower than usual.		That Diseases named were More Prevalent than Usual when Relative Humidity, Ozone, and Velocity of Wind were less than Usual, and Less Prevalent when these conditions were Greater than Usual.			
			For Average Temperature.	For Absolute Humidity.	For Relative Humidity.	For Ozone.		For Velocity of Wind.
						Day.	Night.	
Diarrhea	June to Oct.	Jan. to May, Nov., Dec.	10	10	4	9	10	10
Cholera Infantum.	June to Sept.	Jan. to May, Oct. to Dec.	11	11	5	8	9	9
Intermittent Fever.	May to Oct.	Jan. to Apr., Nov., Dec.	11	11	5	8	9	9

Respectfully submitted,

HENRY B. BAKER.

THE PRINCIPAL METEOROLOGICAL CONDITIONS IN MICHIGAN DURING THE YEAR 1880.

A REPORT BASED ON A COMPILATION OF DATA SUPPLIED BY METEOROLOGICAL REPORTS FROM REGULAR OBSERVERS FOR THE STATE BOARD OF HEALTH, AND FROM OBSERVERS OF THE UNITED STATES SIGNAL SERVICE. —PREPARED IN THE OFFICE OF THE SECRETARY OF THE BOARD.

In the three preceding Annual Reports of the State Board of Health were published summaries relating to the principal meteorological conditions in Michigan during the years 1877, 1878, and 1879. For 1880 observations were continued at most of the old stations, and reports were received from seven new stations, from one of them by the courtesy of the United States Signal Service.* The new stations were Adrian, Escanaba, Hillsdale, Hudson, Minong, Reed City, and Winfield. The instruments at Nirvana were transferred to Reed City, a distance of about ten miles, in April 1880. The instruments at Hudson were transferred to Mallory Lake, a distance of about three miles, in July, 1880.

The names of observers and their places of observation are given in Exhibit 26, page 404. Observations for less than half the year have not been used in this compilation, and observations not for the full year have not been included in the average lines made for the several localities represented in the various tables. As the monthly register in use has been considerably revised, a reduced copy is printed on page 406. The directions for taking and recording observations are on pages 407–10. Suggestions as to the use of meteorological data were printed on pages 213–14 of the Report for 1878.

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* The following stations of the U. S. Signal Service kindly sent to this office for the year 1880 monthly reports of their regular, tri-daily observations, in many cases corrected and reduced, and for the most part on blanks supplied from this office: Alpena, Detroit, Escanaba, Grand Haven, Marquette, and Port Huron. The observers at these stations also made observations of ozone especially for this Board. For study in connection with reports of sickness some of the observations require a different elaboration from that given to to them by the Signal Service Office. This is true especially of the record of atmospheric pressure, which for study with sickness-reports requires to be corrected from temperature and instrumental error but not to be reduced to sea level. To the Chief Signal Officer at Washington is sent each month a copy of the register of observations made at this office, and each week a copy of the weekly summary of said observation, which is published in the Lansing Republican; a copy of this summary is also sent each each week to every observer reporting to this office.

EXHIBIT 26.—*Names of Observers whose Reports are summarized in the following Meteorological Tables and Diagrams, their Places of Observation, and the Counties and Geographical Divisions of the State, in which these Places are situated.*

NAME OF OBSERVER.	PLACE OF OBSERVATION.	COUNTY.	DIVISIONS OF THE STATE.*	MONTHS (INCLUSIVE) FOR WHICH REGISTERS WERE RECEIVED.
Sergt. L. A. Welsh, U. S. Signal Corps	Escanaba	Delta	U. P.	Jan. to July.
Sergt. Charles Dill, U. S. Signal Corps	Escanaba	Delta	U. P.	Aug. to Dec.
Sergt. J. Gilligan, U. S. Signal Corps	Marquette	Marquette	U. P.	Jan. to Dec.
A. B. Simonson, M. D.	Minong	Isle Royal	U. P.	Jan. to April, Sept. and Dec.
Sergt. James A. Barwick, U. S. Signal Corps	Alpena	Alpena	N. E.	Jan. to April. June to Dec.
Private John T. Foy, U. S. Signal Corps	Alpena	Alpena	N. E.	May.
Sergt. Geo. R. Hancock, U. S. Signal Corps	Grand Haven	Ottawa	W.	Jan. to Dec.
Lee S. Cobb[a]	Nirvana	Lake	W.	Jan. to April 25.
E. S. Richardson, M. D[a]	Reed City	Osceola	W.	April 26 to Dec.
Sergt. W. O. Bailey, U. S. Signal Corps	Port Huron	St. Clair	B. & E.	Jan. to Dec.
John S. Caulkins, M. D.	Thornville	Lapeer	B. & E.	Jan. to Dec.
Prof. R. C. Kedzie[b]	Agricultural College, near Lansing.	Ingham	C.	Jan. to Dec.
Supt. I. N. Mitchell	Hastings	Barry	C.	Jan. to June.
Fred. Sweet	Hastings	Barry	C.	July to Sept.
J. J. Grafton, M. D., Warden	State House of Correction, Ionia.	Ionia	C.	Jan. to Dec.
Harry B. Turner	Office State Board of Health, Lansing.	Ingham	C.	Jan. to Dec.
A. W. Nicholson, M. D.	Otisville	Genesee	C.	Jan. to Dec.
Lee S. Cobb	Winfield	Ingham	C.	May 20 to Dec.
John Bell, M. D.	Benton Harbor	Berrien	S. W.	Jan. to Dec.
James S. Reeves, M. D.	Niles	Berrien	S. W.	Jan. to Dec.
Jacob Breedon	Adrian	Lenawee	S. C.	Jan. to Dec.
Prof. M. W. Harrington	University of Michigan, Ann Arbor.	Washtenaw.	S. C.	Jan. to Dec.
J. H. Kellogg, M. D.	Battle Creek	Calhoun	S. C.	Jan. to Dec.
Lyman P. Alden	State Public School, Coldwater.	Branch	S. C.	Jan. to Dec.
F. D. Parmelee	Hillsdale	Hillsdale	S. C.	Jan. to Dec.
A. G. Gumaer	Hudson	Lenawee	S. C.	Jan. and Feb.
Lieut. A. H. Boies[c]	Hudson	Lenawee	S. C.	March to June. Aug. to Dec.
Geo. C. Palmer, M. D.	Supt. Asylum for Insane, Kalamazoo.	Kalamazoo	S. C.	Jan. to Dec.
Edwin Stewart, M. D.	Mendon	St. Joseph	S. C.	Jan. to Dec.
Harrison Peters, M. D.	Tecumseh	Lenawee	S. C.	Jan. to Dec.
Prof. L. McLouth	State Normal School, Ypsilanti.	Washtenaw.	S. C.	Jan. to Feb. May and June. Aug to Nov.
Sergt. C. F. R. Wappenhans, U. S. Signal Corps	Detroit	Wayne	S. E.	Jan. to Dec.
Albert Yates	Washington	Macomb	S. E.	Jan. to Dec.

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* The counties included in each division are stated in Exhibit 1, page 257.

[a] On the removal of Lee S. Cobb from Nirvana to Winfield, Ingham Co., the instruments which had been in use at Nirvana were transferred (about 10 miles) to Reed City in care of E. S. Richardson, M. D.

[b] The statements for the Agricultural College for 1880 are taken from Prof. Kedzie's "Register of Meteorological Conditions" in the Report of the State Board of Agriculture for 1880.

[c] The observations for Hudson from Aug. to Dec. were taken at Mallory Lake, Hillsdale Co., about three miles from Hudson.

EXHIBIT 27.—*Latitude and Longitude, Elevation above Sea Level, and the Average Temperature, and Average Barometric Pressure in 1880, at 29 Meteorological Stations in Michigan,—the names of the Stations being arranged in order by Latitude, highest first.*

LOCALITIES IN ORDER OF LATITUDE,—THOSE FARTHEST NORTH, FIRST.	Latitude, North.	Longitude West from Greenwich.	Altitude (Approximate), above Sea Level.—Feet.	Height of Mercury in Cistern of Barometer, above Sea Level.	Average Temperature, 1880,—Degrees Fahr.	Average Atmospheric Pressure, 1880. Inches of Mercury, Corrected for Temp.
Minong	48°5′	88°2′	----------	----------	----------	----------
Marquette	46°33′	87°36′	636.22	666.33	41.98	29.245
Escanaba	45°46′	87°14′	598.54	619.08	41.38	29.302
Alpena	45°5′	83°28′	587.9	609.5	42.73	29.336
Nirvana	* 43°54′	* 85°42′	‖ 980.	----------	††	----------
Reed City	43°44′	85°28′	101.6	----------	††	----------
Otisville	43°13′	83°31′	820.	----------	46.34	29.133
Grand Haven	43°5′	86°18′	595.3	616.3	47.73	29.346
Ionia	† 42°59′	85°4′	688.10	----------	----------	----------
Port Huron	42°58′	82°29′	600.	630.	46.90	29.332
Thornville	* 42°55′	* 83°12′	‖ 975.	980.	48.75	28.930
Agricultural College, near Lansing	42°44′	84°29′	834.	----------	47.32	----------
Lansing	‡ 42°44′	† 84°33′	§ 800.	----------	48.94	29.016
Hastings	* 42°40′	* 85°17′	§ 750.	----------	----------	----------
Washington	42°40′	83°	746.33	752.33	45.91	29.287
Winfield	* 42°30′	* 84°31′	----------	----------	----------	----------
Detroit	42°20′	83°2′	583.	635.	48.70	29.367
Battle Creek	* 42°20′	* 85°11′	§ 800.	----------	50.61	----------
Kalamazoo	42°13′	85.35′	975.	995.	48.21	29.123
Ann Arbor	42°17′	**	930.	936.	----------	----------
Ypsilanti	* 42°15′	* 83°36′	780.	----------	----------	----------
Benton Harbor	* 42°8′	* 86.28′	§ 582.	----------	----------	----------
Mendon	* 42°2′	* 85°29′	§ 872.	----------	47.75	----------
Tecumseh	* 42°1′	* 83°57′	825.	840.	47.75	28.980
Coldwater	* 41°58′	* 85°0′	§ 989.	----------	----------	----------
Hillsdale	¶ 41°55′	¶ 84°34′	§ 1139.	----------	----------	----------
Adrian	¶ 41°54′	¶ 83°59′	§ 815.	----------	----------	----------
Hudson	* 41°53′	* 84°21′	970.	----------	----------	----------
Niles	* 41°51′	* 86°16′	§ 695.	----------	----------	----------

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* Estimated from lines on a map of Michigan issued by the General Land Office, Department of the Interior, 1878. For stations having no reference mark the latitude and longitude were stated by the observer on the meteorological reports received.

† The exact latitude and longitude of the astronomical post at Ionia is 42°58′ 52″ .53 N. and 85°03′ 49″ .20 W.

‡ The exact latitude and longitude of the astronomical post placed in the ground near the new Capitol at Lansing, by the U. S. Lake Survey in 187-, as determined by observations then made, is 42°43′ 53″ .11 N., and 84°33′ 19″ .68 W.

§ Estimated from data on "Railroad Profiles," pages 179-187, Annual Report of the State Board of Health for 1878.

‖ Estimated from data on Tackabury's Atlas of the State of Michigan.

¶ By table in Tackabury's Atlas of Michigan.

** 6°41′ west from Washington, which is about 77°3′ west from Greenwich.

†† The average of observations of temperature taken at Nirvana from Jan. 1 to April 25 inclusive, and at Reed City from April 26 to Dec. 31 inclusive, was 41.65° Fahr.

Monthly Register of Meteorological Observations, for the State Board of Health, of Michigan.

One copy for each month to be returned, as soon as convenient after the close of the month, to the Secretary of the State Board of Health, at Lansing, Mich.

For the Month of......*188*.., *at*................ } Lat...; Long...; Height of ground above sea level,..ft.; Height of surface of mercury in cistern of barometer above sea level,..
Name and Address of the Observer,............ } ft.; Maker of barometer......; No.... To correct barometer for instrumental error....[insert add or subtract]...inches.

DAY OF MONTH.	THERMOMETER IN OPEN AIR.				PSYCHROMETER.						RELATIVE HUMIDITY, OR PER CENT OF SATURATION.			ABSOLUTE HUMIDITY: GRAINS OF VAPOR IN CUBIC FOOT OF AIR.				PRESSURE OF VAPOR IN INCHES.			BAROMETER. Observed Reading.					
					7 A. M.		2 P. M.		9 P. M.												7 A. M.		2 P. M.		9 P. M.	
	7 A. M.	2 P. M.	9 P. M.	Daily Average.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.	Daily Average.	7 A. M.	2 P. M.	9. P. M.	Barometer.	Therm. At'ched.	Barometer.	Therm. At'ched.	Barometer.	Therm. At'ched.
1.........																										
2.........																										
3.........																										
* * * *																										
31.........																										
Sums.....																										
Averages																										

BAROMETER.				CLOUDS.						WINDS.							OZONE.		REGIST'RING THERMOMETER.		RAIN AND SNOW.				DAY OF MONTH.
Reduced to Freezing Point. (But not to Sea Level.)				7 A. M.		2 P. M.		9 P. M.		7 A. M.		2 P. M.		9 P. M.											
7 A. M.	2 P. M.	9 P. M.	Average.	Per Ct. of Clouds.	Kind.	Per Ct. of Clouds.	Kind.	Per Ct. of Clouds.	Kind.	Direction.	Velocity, Miles per Hour.	Direction.	Velocity, Miles per Hour.	Direction.	Velocity, Miles per Hour.	Total Miles by Anemometer.*	Day: 7 A. M. to 2 P. M.	Night: 9 P. M. to 7 A. M.	Maximum.	Minimum.	Beginning, Rain or Snow.	Ending, Rain or Snow.	Inches of Rain or Melted Snow.	Depth of Snow. Inches.	
																									1
																									2
																									3
																									* * * *
																									31
																									......Sums
																									Averages

TEMPERATURE OF WATER IN WELL, ETC.: Temperature........; Day of month on which the observation is made [which should be near the middle of the month],...........; Depth of well,......feet; Depth of earth above the water in the well,......feet,......inches. * Kind of Anemometer,........

On the back of each blank Register was printed the following:—

DIRECTIONS FOR TAKING OBSERVATIONS AND CARE OF INSTRUMENTS.

TEMPERATURE—THERMOMETER IN OPEN AIR.

The thermometer in open air should be placed in such position as not to receive the direct rays of the sun, or heat from any strongly heated body. It should not be placed against the side of a house, because the house is sometimes hotter, and sometimes colder than the open air. A good position is where it is placed on the north side of some light wall and secured by a hook or bracket five or six inches from the wall, so as not to be heated or cooled by it. It should be screened from exposure to the open face of the sky, lest it give too low a temperature. Unless you have a standard thermometer, please record for the "thermometer in open air" the reading of the dry-bulb thermometer of the psychrometer. The observations are taken three times a day, and the mean of these observations gives very nearly the mean temperature of the day. The mean temperature is sometimes found by adding together the observed temperature at three observations, and dividing the sum by three. Another method, which has been thought to approach the truth more nearly, is to add the observed temperatures at 7 A. M. and 2 P. M. and twice the temperature at 9 P. M., and divide the sum by four.

SELF-REGISTERING THERMOMETERS.

The self-registering thermometers,—maximum and minimum,—are to be placed in the open air under the same conditions as described for the ordinary standard thermometer. Their bulbs should be entirely free. They should be attached in a nearly horizontal position. A board accompanies these instruments, which should be securely fastened with screws, in a vertical position, with its edges horizontal, the edge nearest the bent brass arm being placed uppermost.

After unpacking the minimum, it should be carefully compared with the exposed thermometer, and if an air speck is found in the column, the bulb should be immersed in warm water, and the water be heated until all the air-bubbles disappear in the space at the top of the tube, great care being taken not to break the bulb by heating or cooling it too suddenly.

The brass support for the minimum should be screwed into the upper part of the board, the holes being so arranged as to slightly incline the left end of the support, making the bulb a little lower than the opposite end. The minimum thermometer should be fastened upon the bent brass support by putting the small brass screw which is in the end of the brass support through the hole near the lower *side* of the minimum thermometer scale; the bulb end should be lowered into the notch at the left. After fastening the minimum thermometer upon the support, the lower end of the instrument should be raised until the larger (right-hand) end of the small index touches the end of the column of spirit.

The minimum instrument is read by observing the number of degrees upon the scale where the top of the index rests. After taking a reading, the bulb or lower end of the thermometer should be elevated until the index slides down to the end of the column of alcohol, and shows the temperature of the air at the time of the observation,—and the instrument should then be lowered into the notch at the left of the support, as before.

For the support of the maximum thermometer the long brass bolt with a nut should be oiled and screwed into the board, in the screw-hole to the right. The nut should be taken off and the bolt slipped through the hole in the upper end of the instrument, which will be securely fastened by replacing the nut and screwing it tightly. The plain brass pin is then inserted in the hole at the left of the board, and the thermometer placed upon it so as to incline slightly in that direction. The end of the bolt to which the maximum is attached must be occasionally oiled to prevent friction.

In reading these instruments, the same care should be exercised as with the common thermometer, the eye being directly opposite the upper extremity of the index in the minimum, and the upper end of the column of the mercury in the maximum thermometer. Verify the first observation by a second reading.

The maximum is read by observing the number of degrees upon the scale at the top of the column of mercury. After recording the reading of the maximum thermometer, remove the pin at the left, and taking hold of the thermometer about three inches from the top, swing it around several times, or until the top of the column is brought down to the temperature of the air at the time of the observation. Care must be taken not to touch the bulb, and also that the nut is screwed up sufficiently tight to prevent the instrument from striking against the side of the board to which it is fastened. After adjustment, gradually raise the instrument to a horizontal position, and insert the pin as before. Care should be taken, in elevating the thermometer, not to raise the bulb too high, as the column of mercury would then run to the upper end of the tube. Care should also be taken not to heat this thermometer, by handling or otherwise, and thus leave it registering a higher temperature than it should at that time.

The observations of these instruments should be made, for the preceding day, at the 7 A. M observation, and should then be recorded in the proper column in the line for the day previous. These thermometers should occasionally be compared with the standard thermometer and with the dry-bulb thermometer, and if any error is found, the actual reading of each should be recorded and noted in the register for that month.

HUMIDITY OF THE ATMOSPHERE—PSYCHROMETER.

The amount of moisture present in the air is a matter of great importance, both in a meteorological and in a sanitary point of view. The quantity of water in a state of vapor which a given air-space can contain depends on the temperature. When a given space has as much water in state of vapor as it can hold at a given temperature, it is said to be saturated with vapor. If the temperature be lowered, a portion of the vapor will be condensed into water, but the space will still be saturated. If the temperature be raised and no more vapor be added, the space will be only partially saturated. The temperature at which the vapor contained in the air at any time would saturate the air, if the air were cooled to that temperature, is called its dew-point; and the height of mercury equal in weight to the vapor of water in the air at any time is called its vapor-tension, or the "pressure of vapor in inches" The numbers under the head of "Relative Humidity" denote the per cent of saturation, full saturation being indicated by 100, and half saturation by 50.

The humidity of the air may be measured in several ways, but the easiest is by means of the *wet-bulb* and *dry-bulb* thermometers. The drier the air, or the further it is from saturation with watery vapor, the more rapid will be the evaporation from a wet surface; and consequently, the greater will be the cooling of the body from which evaporation proceeds. If the air is saturated, there will be no evaporation, and the wet-bulb and dry-bulb thermometers will mark the same temperature; but, under all other circumstances, the wet-bulb will mark a lower temperature than does the dry-bulb. The wet-bulb and dry-bulb thermometers therefore measure the rapidity of evaporation at a given temperature, and from this, by means of tables, we deduce the amount of watery vapor present in the air.

The Psychrometer consists of two delicate thermometers, the bulb of one being covered with cloth or wicking kept constantly wet, evaporation being permitted by freely exposing the instrument to the air. It is important that the wet-bulb be kept wet at all times, or, if this is not secured, it should be wet with *pure water* at least fifteen minutes before each observation. Water will evaporate from the solid as well as the liquid state. When the temperature is at or below the freezing point, the wet-bulb should be kept covered with a thin layer of ice. If the temperature of the air is below freezing point, and water is placed on the wet-bulb, the temperature as marked by this thermometer will be 32° till all the water is frozen. It is, therefore, very important to wet the covering of the wet-bulb thermometer fifteen to thirty minutes before each observation, unless it is entirely covered with ice. If the wet-bulb marks 32° while the dry-bulb marks a lower temperature, it is because the water surrounding the wet-bulb is freezing, but not entirely frozen.

The Psychrometer should be so placed as to be freely exposed to the air, observing all the precautions noted in connection with "Thermometer in open air." If lime or dust is allowed to collect upon the covering of the wet-bulb it will be difficult to secure adequate moistening of it, and proper evaporation therefrom. The covering should be renewed at least once in three months, or often enough to secure, at all times, a clean covering; and when renewed the wicking should be thoroughly soaked in water before placing it upon the wet-bulb.

Clean rain water, or distilled water, should be used with this instrument.

PRESSURE OF THE ATMOSPHERE—BAROMETER.

The Barometer may be placed within doors, in a room not subjected to sudden changes of temperature, in a good light, or in a well-protected porch, but protected from the direct rays of the sun. It should be so placed that when drawn out on the hook, for the observation, the observer can look through the cistern and through the tube toward a window or other source of light. The box for the protection of the barometer should be fastened in a vertical position.

For safety in shipping the barometer, the mercury is raised, by means of the screw at the bottom, to just fill the tube. The barometer should never be carried, even across the room, without thus raising the mercury to the top of the tube, and turning the barometer bottom end up. To avoid breaking the thermometer attached, it is well in lifting the barometer to take hold near its ends. After placing the barometer as described, turn the screw at the bottom to the left (down) until the surface of mercury in the cistern just reaches the point of the ivory peg.

To adjust the barometer: By means of the adjusting screw at the lower end of the instrument, raise or lower the mercury in the cistern until it just touches the ivory point. "If there is a line of light visible between the point and mercury, the instrument is set too low. If there is a little dimple, or depression, it is set too high. If neither a line of light nor a depression can be seen, the adjustment has been correctly made. When the mercury is bright, a shadow of the point can be seen, and if the shadow and the point itself form a continuous unbroken line, there can be no line of light. It is usually best to lower the screw till a distinct line of light can be seen, and then gradually raise it until the light disappears." The cistern should be adjusted just before every observation.

To read the barometer when the cistern is properly adjusted, "Take hold of the brass casing of the barometer above or below the thermometer, and, by means of the upper screw near the middle of the tube, bring the back and front lines of the vernier into the same horizontal plane with the top of the mercury in the tube, just touching it and no more, and then remove the hand. Move the eye about, and if, in any position, you can see a line of light between the mercury and vernier, the latter must be moved down a little. If there is no line of light, but a large space is obscured, the vernier must be moved up a little. As the top of the column is more or less curved or convex, when the adjustment is correctly made a small place is obscured in the center, while the light is seen on either side." For further particulars, see *Williamson on the Barometer*, page 143, from which the above quotations are made.

To observe the barometer, first note and record the degree of the thermometer attached, because the heat of the body may affect this. Next, adjust the cistern till the mercury just touches the ivory point. Then gently tap the case so as to lessen the adhesion of the mercury to the tube, adjust the vernier, and note and record the height of the column.

CLOUDS.

Under this head are entered the three daily observations of the aspect of the sky. The per cent of cloudiness is designated by figures, 100 indicating entire cloudiness; 50, that half the face of the sky is covered with clouds; 0, that no clouds are visible; and any intermediate figure, the intermediate per cent of cloudiness. The "kinds of clouds" are to be entered by the following abbreviations: *St.*, Stratus; *Cu.*, Cumulus; *Cir.*, Cirrus; *Nim.*, Nimbus; *Cir. St.*, Cirro-Stratus; *Cu. St.*, Cumulo-Stratus; *Cir. Cu.*, Cirro-Cumulus.

WINDS.

The winds are recorded in the direction *from* which they blow, as indicated by a wind-vane. The direction is entered in eight points of the compass: N., NE., E., SE., S., SW., W., NW. The velocity can be measured accurately only by an anemometer. The velocity may be approximately estimated and registered by figures, expressing the number of miles per hour, as follows. The force corresponding to the estimated velocity is stated in the second figure-column:

POPULAR NAME OF WIND.	Velocity, Miles per Hour.	Force Pressure in lbs. per sq. ft.	POPULAR NAME OF WIND.	Velocity, Miles per Hour.	Force Pressure in lbs. per sq. ft.
Very Light Breeze	2	.02	Gale	45	10.13
Gentle Breeze	4	.08	Strong Gale	60	18.00
Fresh Wind	12	.72	Violent Gale	75	28.13
Strong Wind	25	3.13	Hurricane	90	40.50
High Wind	35	6.13	Most Violent Hurricane	100	50.00

The *force* or pressure of the wind increases as the square of the velocity increases, being 2 oz. per sq. ft. for a velocity of 5 miles per hour; 8 oz. per sq. ft. for a velocity of 10 miles per hour; 2 lbs. per sq. ft. for a velocity of 20 miles; and 8 lbs. per sq. ft. for a velocity of 40 miles per hour. The ratio between the velocity and force of the wind may be briefly stated thus: The force (stated in lbs. per sq. ft.) equals the square of the velocity (stated in miles per hour) divided by 200; or the velocity equals the square root of 200 times the force.

OZONE.

Observations on ozone are especially desired to ascertain its relations to health and disease. At least two observations are taken daily,—a "Day observation," taken from 7 A. M. to 2 P. M., and a "Night observation," taken from 9 P. M. to 7 next morning, and recorded in the line for the day on which the paper was put out. The observations are taken by means of Schonbein's Test Paper, and the results determined by comparing the test-paper employed with the ozone-scale. Both the test-paper and the ozone-scale will be furnished from this office. Timely notice should be given of the exhaustion of such supply, that no break in the observations may occur. The stock of test-paper must be preserved in closed bottles or jars in a dry and dark closet, because sunlight will form ozone and color the paper so as to destroy its value as a test. Only colorless test-paper must be used in measuring ozone; and it should be exposed where it will not be subject to action of sulphurous acid gas, as very near where coal is burned. Even the fumes of burning sulphur from a single match held near the test-paper may bleach it after having been colored by exposure.

Take a strip of the paper one-half inch wide and four inches long, moisten one-third of the paper in pure water, and pin it up in a place screened from direct sunlight but freely exposed to the air and diffuse daylight. An ordinary spring clothes-pin, properly fastened in position, is a convenient article to hold the test-paper during the exposure. After exposure for the time stated above, dip the paper in clear water, immediately compare it with the ozone scale, and enter in the proper column the figure on that portion of the scale which most nearly corresponds in color with the test-paper used.

In deciding the amount of ozone for any observation by comparison of the test-paper with the ozone-scale, the general tone of the test-paper should be taken, and not the exceptional marks or lines due to scratching the surface of the paper. When, as will occasionally happen, exposure of the paper reveals the fact of uneven spreading of the test material, shown by alternate streaks of color and absence of color, an attempt should be made to record such average of the whole as would probably have been shown if the starch mixture had been evenly spread. The observation should be made and recorded from the side of the paper most darkly colored, whether front or back.

RAIN AND SNOW.

The simplest way of measuring the amount of precipitation of atmospheric moisture would be to expose a cylindrical vessel with vertical sides freely to the rain or snow in a position where surrounding buildings, trees, etc., would not disturb the rain fall, and to measure the depth of water caught in each storm. With a rain-gauge more accurate results can be secured. The sectional area of the baisin of the rain-gauge supplied by this Board is ten times that of the tube, so that the depth of the water caught in the gauge is ten times the actual rainfall. Only one-tenth, therefore, of the depth of water found in the gauge should be recorded on the register. The measuring-stick is divided into tenths of an inch, and the rainfall should be recorded in inches, tenths, and hundredths, expressed decimally. This may conveniently be done by writing the inches and tenths of an inch, as indicated on the measuring stick, and then moving the decimal point one place to the left. While the gauge is of a depth sufficient for most storms, it has been known to overflow during a long, heavy rain. When there is danger of an overflow, the water in the gauge should be measured and poured out oftener than once a day. The regular observation should be made at 7 A. M., at which time the total rainfall during the preceding 24 hours should be recorded on the line for the preceding calendar day. The gauge should be securely supported by a frame so that it will not be blown over; it should be placed sufficiently far away from buildings, trees, and fences that it may at all times and with all directions of the wind receive the full amount of rainfall.

The rain-gauge is not capacious enough nor of suitable shape to measure the fall of snow. This should be measured at some place where it seems to be the average. The snow which the rain-gauge might receive during a storm, would not ordinarily, when melted, be a fair test of the inches of melted snow.

To ascertain the amount of water in any fall of snow, a column of snow the depth of the fall, of the same area as that of the top of the gauge, should be melted and measured in the gauge, as so much rain. It is usually stated that ten inches of snow will make one inch of water. But this is not uniformly true. It is desirable that observers fill both the columns, for "depth of snow," and for "inches of rain and melted snow."

TEMPERATURE OF WATER IN WELLS.

The temperature of water in wells from sixty to one hundred feet deep differs but little from the mean temperature of the place, unless disturbed by volcanic agencies. The mean of the monthly observations of the temperature of any deep well will be very nearly the mean temperature of that locality. These observations should be taken and recorded once every month. By securing a thermometer in the well-bucket, lowering this into the well and filling it with water, and allowing it to remain in the well some minutes to acquire the temperature of the well-water, the temperature of the well-water will be readily observed by noting the thermometer when the bucket is drawn up. If a pump is used, pump the water rapidly for fifteen minutes into a pail containing the thermometer, and note the temperature at the close.

DEPTH OF EARTH ABOVE THE GROUND WATER.

The depth of earth above the water in the ground, particularly that underlying residences, is believed to have some influence on health. Variations in the level of the ground water also have relations to health wherever the water supply for domestic use is derived from wells. It is desirable to study the subject systematically by means of records of regular observations which can be compared with the coincident conditions of health or disease. Although the well under the notice of the meteorological observer may not in all cases be an average of the wells in the vicinity, yet regular observations of it will give comparative statements for the several months of the year, and for the several years during which observations are taken. These statements can be compared with the records of greater or less prevalence or absence of diseases,—such, for instance, as typhoid fever,—and it is quite possible in this way to study the relations by months and years, even though additional facts may be requisite to enable us to study the subject by localities. The study by years and months now seems to be of even greater practical importance than is that by localities.

It is hoped that each observer will carefully make observations on this point, at least once in each month, and as near the middle of the month as he can, and make a record of such observations at the bottom of the register, in connection with the statement of the temperature of the water in the well, adding any information which he may have which will make the record more valuable.

PLEASE NOTE OBSERVATIONS OF THE FOLLOWING CASUAL PHENOMENA:

Fogs—Dates, and time of appearance and of lifting.
Frosts—Time of early and late, particularly first and last.
Days when there was *melting* snow on the ground.
Depth of Ground Frozen, in feet and inches; time of disappearance of frost from the ground.
Rivers, Lakes, Canals, and Streams—Temperature; time of closing and opening, and their extreme rise and fall.
Earthquakes—Time of occurrence, direction of impulse, number of shocks and effects produced.
Hazy or Smoky Appearance of the Atmosphere—Time of occurrence and intensity.

Please also note and report any other important phenomena, especially coincidences between meteorological conditions and the outbreak, increase, or decline of any disease among the people, among domestic animals, or affecting cereals or any plants usually consumed by men or domestic animals; as, for instance, any apparent relation between dryness or humidity of the atmosphere and the prevalence of croup or pneumonia,—between an excess or deficiency of ozone and the prevalence of influenza, or other disease, in man or animals,—between hot and moist atmosphere and smut in wheat or other grains, etc., etc.

USES DESIGNED TO BE MADE OF THESE METEOROLOGICAL DATA.

The facts tabulated and otherwise embraced in this article are collected for use in studies relating to the causes of sickness and deaths in Michigan. They have been carefully digested and prepared, and are here made available for use in connection with the facts respecting sickness in Michigan, grouped in the article on "Weekly Reports of Diseases in Michigan, in 1880," pages 305–402. They may also be used in connection with the article on "Diseases in Michigan in 1880," on pages 252–88 of this Report; and they will be found useful for study in connection with the records of deaths in Michigan during the same year which are returned by the Supervisors, to be published by the State Department under the title of "Vital Statistics of Michigan."

DIAGRAMS RELATING TO METEOROLOGICAL CONDITIONS IN 1880.

To facilitate study of the tables relating to the several conditions treated, diagrams have been constructed, in which the relative degree or intensity of each condition in different months and at different stations is indicated by the hight at which lines for each station cross perpendicular lines for each month of the year. These diagrams may be compared with similar diagrams relating to meteorological conditions in 1877–8–9, in the three preceding Annual Reports of this Board; they may also be compared with diagrams relating to sickness in Michigan in 1880, on pages 308, 382, 390, 400, 401. A full explanation of the method of constructing and using these diagrams is printed on pages 307 and 308–9 of the Report for 1880.

In Diagrams XV., XVI., and XVII., relating to the direction of the wind, the figures or separate groups of lines are designed to indicate the number and the proportion of regular observations, at 7 A. M., 2 P. M., and 9 P. M. daily, at which the wind was blowing from each of the eight principal points of compass at the places and for the periods of time stated in the margin. Each figure consists of lines drawn to a common center from some or all of the following directions on the page, and indicating that at the times of observation the wind blew from points of the compass as follows: Lines toward the common center from the top of the page indicate observations that the wind was blowing from the north; from the right-hand side, observations that the wind was from the east; from the bottom of the page, that it was from the south; from the left-hand side, that it was from the west; from the upper left-hand corner, that it was from the north-west; from the upper right-hand corner, that it was from the north-east; from the lower right-hand corner, that it was from the south-east; from the lower left-hand corner, that it was from the south-west. The length of each line denotes the number of regular observations at which the wind blew from the direction indicated by that line, .01 of an inch being the unit, or the length of line for one observation. The circles indicate calms, the number of regular observations at which there was no wind being denoted by the length of the *radius* of the circle drawn about the point of convergence of the lines for a given place or period of time, the length for one observation being, as before, .01 of an inch.

METEOROLOGICAL CHARACTERISTICS OF THE YEAR 1880.

Systematic collection of meteorological data has not been carried on long enough to secure a knowledge of the average meteorological characteristics of the State of Michigan as a whole. So far as the evidence goes it seems to support the view that the conditions at Lansing are in many ways near the average for the State. However this may prove to be, it seems that the best that can be done now with respect to a long series of years is to use for purposes of comparison, the data collected at some central station and, fortunately, the statistics at Lansing are available for this purpose.

In Exhibit 28, page 413, facts respecting several conditions at the Agricultural College, near Lansing, are grouped for study and for comparison of the year 1880 with the averages of preceding years. From this exhibit it will be seen that the average temperature for 1880 was .66° F. higher, than the average for 16 preceding years, and .44° higher than the average for 1879. The range of temperature during the year 1880 was 3° F. less , and the average monthly range of temperature was 4° F. less than the average for 7 preceding years. The average amount of ozone in the air during the day observation, from 7 A. M. to 2 P. M., was .80 degrees greater in 1880 than in 1879, while the average amount by the night observation, from 9 P. M. to 7 A. M., was .27 degrees greater.

In the Report of this Board for 1880, exhibits were published showing, for the several conditions, comparisons by months in 1879 with the average of the same conditions during a series of years preceding. In this Report all such exhibits are omitted except two,—Exhibits 28 and 31, following; and for such comparisons not included in those exhibits, the reader is respectfully referred to the preceding Report.

By comparing the average of conditions at several stations in 1880 with the average of those at several stations in 1879 as shown in Exhibits, 35, 36, 37, 41, and 46, it will be seen that respectively,—The average absolute humidity of the atmosphere (grains of vapor in a cubic foot of air) was but .01 grains greater in 1880 than in 1879. The average relative humidity of the air (per cent of saturation) was 1 per cent less in 1880 than in 1879. The average per cent of cloudiness in 1880 was 4 per cent greater than in 1879. The rain-fall in 1880 was 5.50 inches more than in 1879; but in 1879 the rain-fall was exceptionally small. The average pressure of the atmosphere was .022 of an inch of mercury less in 1880 than in 1879.

Although the foregoing indicates that as a whole, the year 1880 was not remarkable meteorologically, yet by a study of the subject by months, it seems much more so than from the foregoing would be supposed ; because the unusully warm winter of 1879–80 was followed by unusually cold months in the latter part of the year, and although the average for the entire year was not so very far from a normal year, a comparison by months leads to interesting results, as may be seen by following the subject as is done in Exhibit 28, page 413; and comparisons of the several conditions in 1880 with those in 1879 may be seen in exhibits and tables following, such, for instance, as Exhibits 31 and 32, page 417 wherein the temperature is studied by months.

EXHIBIT 28.—*Statements of Meteorological Conditions in the Year and in each Month of the Year 1880, Compared with Annual and Monthly Averages for 1879 and for several Stated Periods of Years,—from Observations by Prof. R. C. Kedzie, at the State Agricultural College*, near Lansing, Michigan.*

METEOROLOGICAL CONDITIONS.	1880 COMPARED WITH AVERAGES FOR PREVIOUS YEARS. No. of Years Averaged, Ending with 1879.	1880 COMPARED WITH AVERAGES FOR PREVIOUS YEARS. More (+), or Less (-), in 1880 than the Average for previous Years.	In 1880 More (+), or Less (-), than in 1879.	METEOROLOGICAL CONDITIONS.	1880 COMPARED WITH AVERAGES FOR PREVIOUS YEARS. No. of Years Averaged, Ending with 1880.	1880 COMPARED WITH AVERAGES FOR PREVIOUS YEARS. More (+), or Less (-), in 1880 than the Average for Previous Years.	In 1880 More (+), or Less (-), than in 1879.
YEAR 1880.*				YEAR 1880.—*Continued.*			
Av. Temp'ature	16	+.66° F.	+.44° F.				
Range of Temp.†	7	-3° F.	-4° F.				
Av. Monthly Range of Temp.†	7	-4°	-7°	Day Ozone‡	8	+.35°	+.80°
				Night Ozone‡	8	-.38°	+.27°
JANUARY.				FEBRUARY.			
Av. Temp.	16	+14.85° F.	+17.91° F.	Av. Temp.	16	+5.07° F.	+8.79° F.
Range of Temp.†	7	-7° F.	-9° F.	Range of Temp.†	7	+4° F.	+14° F.
Day Ozone‡	8	-1.79°	-1.03°	Day Ozone‡	8	-1.09°	-.71°
Night Ozone‡	8	-2.65°	-1.51°	Night Ozone‡	8	-1.62°	-.84°
MARCH.				APRIL.			
Av. Temp.	16	+3.90° F.	+2.31° F.	Av. Temp.	16	-.04° F.	+1.03° F.
Range of Temp.†	7	-16° F.	+13 F.	Range of Temp.†	7	-7° F.	-13° F.
Day Ozone‡	8	+.80°	+1.59°	Day Ozone‡	8	+1.28°	+2.10°
Night Ozone‡	8	-.81°	+.64°	Night Ozone‡	8	+.12°	+.93°
MAY.				JUNE.			
Av. Temp.	16	+6.17° F.	+5.54° F.	Av. Temp.	16	-.67° F.	+1.58° F.
Range of Temp.†	7	-15° F.	-19° F.	Range of Temp.†	7	-4° F.	-11° F.
Day Ozone‡	8	+.04°	+.86°	Day Ozone‡	8	+.86°	+1.24°
Night Ozone‡	8	-.87°	+.35°	Night Ozone‡	8	-.06°	+.67°
JULY.				AUGUST.			
Av. Temp.	16	-4.11° F.	-5.99° F.	Av. Temp.	16	-.60° F.	-1.42° F.
Range of Temp.†	7	-6° F.	-6° F.	Range of Temp.†	7	-11° F.	-17° F.
Day Ozone‡	8	+1.15°	+.71°	Day Ozone‡	8	+1.33°	+1.39°
Night Ozone‡	8	+.07°	+.10°	Night Ozone‡	8	+.48	+.47°
SEPTEMBER.				OCTOBER.			
Av. Temp.	16	-4.26° F.	-.38° F.	Av. Temp.	16	-1.83° F.	-11.05° F.
Range of Temp.†	7	0 F.	0 F.	Range of Temp.†	7	-10° F.	-20° F.
Day Ozone‡	8	+.24°	+.06°	Day Ozone‡	8	-.57°	-.42°
Night Ozone‡	8	-.15°	-.38°	Night Ozone‡	8	-.89°	-.13°
NOVEMBER.				DECEMBER.			
Av. Temp.	16	-7.88° F.	-10.70° F.	Av. Temp.	16	-3.08° F.	-5.39° F.
Range of Temp.†	7	+12° F.	+4° F.	Range of Temp.†	7	+9° F.	+3° F.
Day Ozone‡	8	+1.17°	+1.57°	Day Ozone‡	8	+.78°	+2.19°
Night Ozone‡	8	+.63°	+.70°	Night Ozone‡	8	+1.18°	+2.36°

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* For November and December, 1879, the observations were made by Harry B. Turner, at the office of the State Board of Health, Lansing.

† By registering thermometers, set at 7 A. M., and recorded at 7 A. M. for the preceding calendar day.

‡ Degrees, by scale of 10 degrees of coloration of Schönbein's test paper, exposed from 7 A. M. to 2 P. M., for the day observation; and from 9 P. M. to 7 A. M., for the night observation.

GENERAL REMARKS TAKEN FROM THE REPORTS OF METEOROLOGICAL OBSERVERS. RELATING TO TEMPERATURE IN 1880.

JANUARY.

Considerable plowing has been done in this county during the month of January. There has been no ice stored in ice-houses, and the ground is not frozen.—*Edwin Stewart of Mendon, on Report for January.*

Exceptionally warm for winter,—bees out lively, Jan. 27. Caterpillars and other insects seen as the month closed. There is no snow, no ice in the streams and ponds, and scarcely any in the ground. No sleighing this month.—*J. S. Caulkins, M. D., of Thornville, on Report for January.*

River open since the first day of January.—*Geo. R. Hancock, of Grand Haven, on Report for January.*

FEBRUARY.

Frost all out of ground Feb. 28. Streams froze up three times and thawed out (during winter) Ice at no time more than six inches thick. Not more than one-half the usual amount of ice was put up.—*H. Peters, M. D , of Tecumseh, on report for February.*

February has been very mild for this latitude, and by so much freezing nights and thawing days has materially injured the clover,—wheat not so much. The ice crop is a total failure, none having yet been put up. The month closes with more than usually wintery day. There has been no sleighing.—*J. S. Caulkins, M. D., of Thornville, on Report for February.*

EXHIBIT 29.—*Depth of Well; Depth of Ground above Water in Well; Temperature 1880, as reported by Meteorological Observers for the State*

STATIONS IN MICHIGAN.	JANUARY.			FEBRUARY.			MARCH.			APRIL.			MAY.			JUNE.		
	Depth of Well,—Ft., In.	Depth of Ground above Water in Well,—Ft., In.	Tempt. of Water in Well,—Deg. F.	Depth of Well,—Ft., In.	Depth of Ground above Water in Well,—Ft., In.	Temp. of Water in Well,—Deg. F.	Depth of Well,—Ft., In.	Depth of Ground above Water in Well,—Ft., In.	Temp. of Water in Well,—Deg. F.	Depth of Well,—Ft., In.	Depth of Ground above Water in Well,—Ft., In.	Temp. of Water in Well,—Deg. F.	Depth of Well,—Ft., In.	Depth of Ground above Water in Well,—Ft., In.	Temp. of Water in Well,—Deg. F.	Depth of Well,—Ft., In.	Depth of Ground above Water in Well,—Ft., In.	Temp. of Water in Well,—Deg. F.
Escanaba	------	----	----	----	----	----	----	----	----	----	-----	------	----	-----	----	----	----	----
Marquette	*10 4	----	33^{28}	†---	----	----	†---	----	----	----	-----	------	†9	-----	45^{15}	†9	----	46^{15}
Minong	------	----	----	----	----	----	----	----	----	----	-----	------	----	-----	----	----	----	----
Nirvana	22	----	44^{27}	22	19 6	42^{16}	22	19 6	40^{17}	22	19 6	42^{17}	----	-----	----	----	----	----
Reed City	------	----	----	----	----	----	----	----	----	----	-----	------	16	10	45^{16}	16	10	45^{14}
Thornville	20	----	40^{24}	20	18	40	20	18 9	42^{17}	20	17 10	42^{15}	20	17 8	48^{16}	20	17 6	47^{16}
Hastings	------	----	----	16 6	13 6	45^{20}	16 6	13 7	45^{18}	16 6	12 11	40.50^{17}	16 6	12 10	48^{17}	----	----	----
Niles	30	27 5	46	----	----	----	30	27 5	48^{15}	----	-----	------	----	-----	----	----	----	----
Adrian	------	----	47^{31}	----	----	----	----	----	----	----	-----	------	----	-----	----	----	----	----
Ann Arbor	------	----	----	----	----	----	20	15	44^{20}	----	-----	------	----	-----	----	----	----	----
Hillsdale	------	----	----	----	----	----	27	20	50^{18}	27‡	19	48^{27}	27	17 9	48^{17}	27	17 9	48^{16}
Hudson	70	65	47^{25}	----	----	----	----	----	----	----	-----	------	----	-----	----	----	----	----
Kalamazoo	24	22	49^{31}	24	20	49^{24}	24	20 6	49^{19}	24	21	49^{21}	24	20 6	50^{24}	24	18 6	50^{17}
Mendon	19	----	50^{25}	19	----	49^{15}	19	----	48^{14}	19	-----	48^{17}	19	-----	49^{16}	19	----	50^{13}
Tecumseh	36	32	50^{15}	36	31 6	50^{15}	36	32	50^{15}	36	31	49^{16}	36	30 6	56^{16}	36	30 6	50^{15}
Washington	12 3	11	39^{23}	12 3	2	37^{19}	12 3	2 7	37^{15}	12 3	2 3	41^{15}	12 3	2 8	46^{15}	12 3	2 1	54^{16}

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* Lake Superior, at point where temperature was taken. † No observation taken on account of the well is on a rise of ground of, I think, fully 20 feet from a point 30 rods distant. § Other data Exhibits 5 and 6 and in summary footnotes on pages 267-9 of this Report.

NOTE.—The small figures above and at the right of the numbers denoting the degrees of temper-

MARCH.

Ground frozen ten inches deep during the past winter, at Hudson, Michigan.

SEPTEMBER.

Some ice found Sept. 30, but no damage done by it.—*J. S. Caulkins, M. D., of Thornville.*

Ice formed one inch in thickness in barrel standing out on night of Sept. 18.—*A. H. Boies, of Hudson.*

OCTOBER.

During the night of Oct. 16, three inches of snow fell. The first snow of the season.—*E. S. Richardson, M. D., of Reed City.*

NOVEMBER.

Navigation closed Nov. 22, 1880.—*Serg't James A. Barwick, of Alpena.*

DECEMBER.

Navigation closed on Nov. 29, 1880.—*Serg't Charles Dill, of Escanaba.*

Ice 16 inches thick on the lakes and ponds.—*J. S. Caulkins, M. D. of Thornville, on Report for December.*

Last boat of the season.—*Serg't Jas. A. Barwick, of Alpena, on report for December.*

Ground frozen in exposed places 2½ feet deep.—*Thornville, Mich.*

of Water in Well, and Day of observation of such temperature, in each month of the year Board of Health and for the United States Signal Service. §

JULY.			AUGUST.			SEPTEMBER.			OCTOBER.			NOVEMBER.			DECEMBER.		
Depth of Well,—Ft., In.	Depth of Ground above Water in Well,—Ft., In.	Temp. of Water in Well,—Deg. F.	Depth of Well,—Ft., In.	Depth of Ground above Water in Well,—Ft., In.	Temp. of Water in Well,—Deg. F.	Depth of Well,—Ft., In.	Depth of Ground above Water in Well,—Ft., In.	Temp. of Water in Well,—Deg. F.	Depth of Well,—Ft., In.	Depth of Ground above Water in Well,—Ft., In.	Temp. of Water in Well,—Deg. F.	Depth of Well,—Ft., In.	Depth of Ground above Water in Well,—Ft., In.	Temp. of Water in Well,—Deg. F.	Depth of Well,—Ft., In.	Depth of Ground above Water in Well,—Ft., In.	Tempt. of Water in Well,—Deg. F.
18	15 4	50^{20}	18	15 4	50^{20}	------	------	----	15	6	45^{15}	15	6	41^{20}	------	----	----
† 11 6	------	61^{15}	† 11 6	------	63^{15}	† 11 6	------	58^{15}	† 11	------	48^{15}	† 11	------	38^{15}	† 11	----	33^{9}
------	------	----	------	------	----	10	------	52^{15}	------	------	----	------	------	----	10	----	40^{15}
------	------	----	------	------	----	------	------	----	------	------	----	------	------	----	------	----	----
16	16	47^{18}	16	19	48^{15}	16	10	50^{17}	16	10	47^{20}	16	10	49^{18}	16	10	49^{20}
20	17 4	48^{16}	20	17 4	48^{15}	20	17 2	50^{17}	20	17 7	47^{20}	20	17 5	42^{12}	20	17 5	42^{15}
7	4	60^{22}	------	------	----	------	------	----	------	------	----	------	------	----	------	----	----
------	------	----	------	------	----	------	------	----	------	------	----	------	------	----	------	----	----
------	------	----	------	------	----	------	------	----	------	------	----	------	------	----	------	----	----
------	------	----	------	------	----	------	------	----	------	------	----	------	------	----	------	----	----
27	19	49^{15}	27	20 5	49^{16}	27	21 7	50^{16}	27	22 10	50^{16}	27	23 7	49^{15}	27	24 5	49
------	------	----	15	8	56^{15}	15	12	57^{16}	15	11	46^{16}	15	10	44^{18}	15	8	42^{15}
------	------	----	24	21	52^{20}	24	21 6	52^{15}	24	21 6	52^{13}	24	19	51^{17}	24	22	50^{16}
19	------	52^{20}	19	------	53^{17}	19	------	55^{24}	19	------	55^{18}	19	------	53^{20}	19	----	52^{17}
36	30 6	50^{15}	36	30	50	36	30 6	50^{15}	36	30 6	50^{15}	36	31	49^{15}	36	31 6	49^{15}
12 3	3 4	59^{16}	12 3	4 1	58^{16}	12 3	3 9	58^{17}	12 3	2 11	52^{18}	12 3	2 8	39^{24}	12 3	2 9	40^{16}

ice being in harbor all the month. ‡ Water raised in well two feet between April 16 and 28, and relative to depth of water in wells, depth of earth above ground water, etc., may be found in

ature, state the day of the month on which the observation was made.

EXHIBIT 30.—*Temperature of Water in Cedar River, near the Agricultural College October 6-9, for the Years 1874-80.*

	Average, 7 Years, 1874-80.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
Temperature of Water in Cedar River, taken from 6th to 9th of Oct., Degrees Fahr.	54.°6	54°	50°	46°	50°	60°	68°	54°

AVERAGE TEMPERATURE.

By the observations at the Agricultural College, the average temperature for the year 1880 was a little above the average for the 16 preceding years, 1864-79. The average monthly temperature was considerably higher than the average for those years in January, February, March, and May;* and it was less than the average for the other months of the year. The average temperature in January, 1880, was 14.85° F. above the average January temperature for the 16 preceding years; and the average temperature in November, 1880, was 7.88° below the average November temperature for those years.

At the Agricultural College, the observations show that the average temperature for the year was a little higher in 1880 than in1879; and the average monthly temperature was higher in 1880 than in 1879 from January to June, and lower from July to December. The temperature and the variations for each of these periods are given in Exhibit 31, page 417.

By a comparison of the average for 15 stations in 1880 with the average for 19 stations in 1879 (fourteen of the stations being the same for both years), it would seem that the average temperature for the year was a little lower in 1880 than in 1879; and that the average monthly temperature was higher in 1880 than in 1879, in January, February, April, May, June, and September, and lower in other months of the year. This comparison is definitely stated in Exhibit 32, page 417.

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*CAUSE OF THE MILD WINTER.—The winter, which is now far spent, seems destined to take a memorable place in the annals of meteorology. Although its extraordinary thermometric ranges have yet to be fully made up, it bids fair to exhibit the most marked record of sunshine and warmth east of the Mississippi and south of the forty-fifth parallel. In looking for the explanation of the present mild weather it is important to note that the highest temperatures in December were reported by the Signal Service from the South Atlantic States. This fact furnishes one clue to the solution of the mystery. Atlantic observations taken a year ago revealed the fact that the temperature of that ocean in high latitudes was unusually high, and it would seem from recent examination that its equatorial surface is now exceptionally warm. The average temperature of the water throughout December last, as reported by the Signal Service last week from six of its South Atlantic stations, show that the mean temperature of the ocean from Key West to Norfolk was then 7.6 degrees higher than in the same period of 1878. With such or even less increase of its heat the evaporation from its tepid extratropical bosom must be very great. It is obvious enough that the stores of heat contained in this excessive evaporation, when wafted in upon the continent and drawn into the Mississippi Valley, must exert a powerful influence in tempering the winter weather east of the great river.

But the abnormal heat of the seas washing our southern coasts is but one factor in the solution of our mild winter problem. An old seaman has said, "he that watches his barometer watches his ship;" and doubtless to the barometric conditions prevailing over the country we must look for the fuller explanation of the phenomenon in question. Glancing at the most recent summary of the government weather reports, it is at once seen that over the entire interior of the country to the base of the Rocky Mountains a "low pressure" condition has prevailed, inducing a general movement of the atmosphere from the "high pressure" zones extending along the Gulf and South Atlantic Coasts. This "low barometer" range was the marked feature of the autumnal weather, and there has been no rush of heavy ærial currents from the far north or northwest, still less from the Pacific coast, sufficient to fill up or efface the vast interior depression, which, with a few intermissions, has prevailed since October set in. Humid air currents from the over-heated ocean to the southeast of the United States, set up and maintained by the indraught of the low pressure in the interior, is apparently the true solution of the remarkable winter of 1879-80.—*N. Y. Herald.*

The remarkable mildness of the winter of 1879-80 was predicted, and an interesting hypothesis of its cause, antecedent to what is suggested in the foregoing, was published, by W. Mattieu Williams in *Nature*, London, England, December 11, 1879. The unusual accumulation of warm water near the source of the gulf stream, Mr. Williams attributes to the prevalence of Arctic winds in November. Speaking of the gulf stream, Mr. Williams says:—"It may be that our agricultural troubles of the past three years are in some measure due to its disturbance; if so, it is of national importance that we should study its variations in order to learn whether they are reducible to law, and thus capable of anticipations sufficiently reliable to induce prudential preparation for their national consequences."

The average temperature by months and for the year at each of 16 stations is stated in Table I., page 418. The average temperatnre by months at twelve of these stations is graphically represented in Diagrams I. and II., pages 419 and 420.

EXHIBIT 31.—*Comparison of the Average Temperature during the Year and during each Month of the Year 1880, with the Annual and with the Monthly Averages for the Year 1879, and with the Averages for the Sixteen Years 1864–79.—Observations made by Prof. R. C. Kedzie, at the State Agricultural College,* near Lansing, Michigan.*

YEARS, ETC.	AVERAGE (MEAN) TEMPERATURE,—DEGREES FAHR.												
	Annual Av.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.*	Dec.*
Av. for 16 years, 1864–79	46.66	22.25	21.12	31.60	45.91	58.13	68.27	72.15	69.18	60.09	48.06	35.40	25.15
1879 *	46.88	19.19	20.40	33.19	44.84	58.76	66.02	74.03	70.00	56.21	57.28	38.22	27.46
1880	47.32	37.10	29.19	35.50	45.87	64.30	67.60	68.04	68.58	55.83	46.23	27.52	22.07
In 1880 **Higher** than Av. 16 years, 1864–79	.66	14.85	5.07	3.90	......	6.17	......	......	......	......	......	......	......
In 1880 **Lower** than Av. 16 years, 1864–79	....	......	......	......	.04	......	.67	4.11	.60	4.26	1.83	7.88	3.08
In 1880 **Higher** than in 1879	.44	17.91	8.79	2.31	1.03	5.54	1.58	......	......	......	......	......	......
In 1880 **Lower** than in 1879	....	......	......	......	......	......	......	5.99	1.42	.38	11.05	10.70	5.39

*For November and December, 1879, the observations were made by Harry B. Turner, at the office of the State Board of Health, Lansing.

EXHIBIT 32.—*Comparison, by Year and Months, of the Average Daily Temperature at 15 Localities (in Michigan) in 1880 with the Average in 1879 at 19 Localities.**

YEARS, ETC.	AVERAGE TEMPERATURE,†—DEGREES FAHR.												
	Annual Av.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. at 19 Stations in 1879 †	46.82	20.86	10.69	33.08	44.29	58.03	64.70	73.16	68.99	57.43	57.43	36.80	26.41
Av. at 15 Stations in 1880 †	46.55	34.06	27.93	31.00	44.39	62.27	67.41	69.39	68.07	59.54	46.69	27.24	20.67
In 1880 **Greater** than in 1879	....	13.20	7.24	......	.10	4.24	2.71	......	......	2.11	......	......	......
In 1880 **Less** than in 1879	.27	......	......	2.08	......	......	......	3.77	.92	......	10.74	8.56	5.74

* Fourteen of the stations, Marquette, Alpena, Grand Haven, Nirvana, Port Huron, Thornville, Lansing, Otisville, Battle Creek, Kalamazoo, Mendon, Tecumseh, Detroit, and Washington, were the same for both years; Petoskey, Niles, Coldwater, Ypsilanti, and Woodmere Cemetery were included in the average for 1879 but not in that for 1880; Escanaba was included in the average for 1880 but not in that for 1879.

† For 1879 the daily averages from which the monthly averages were determined were one-third the sum of the observations at 7 A. M., 2 P. M., and 9 P. M.; for 1880 the daily averages were found by dividing the sum of the observations at 7 A. M. and 2 P. M. plus twice the 9 P. M. observation by four.

TABLE I.—*Average Temperature, in Degrees Fahr., for the Year, and for each Month of the Year 1880, at each of 16 Stations in Michigan, and also the Average for 15 of the Same Stations,—as indicated by one-fourth of (7 A. M. + 2 P. M. + twice 9 P. M. observation).—From observations made Daily at 7 A. M., 2 P. M., and 9 P. M.,†† by Observers* for the State Board of Health, and for the U. S. Signal Service.*

STATIONS IN MICHIGAN.	Division of the State.†	TEMPERATURE, IN DEGREES FAHR.														
		YEAR.			MONTHS, 1880.											
		1878. §	1879. §	1880.	Jan.	Feb.	Mar.	Apr.	May.	J'ne.	J'ly.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 15 Stations ‡	------	‡‡	§§	46.55	34.06	27.93	31.00	44.39	62.27	67.41	69.39	68.07	59.54	46.69	27.24	20.67
Escanaba.......*	U. P.†	-----	-----	41.38	25.70	19.20	22.60	37.00	55.30	63.70	66.10	65.10	57.40	44.00	23.30	17.10
Marquette......	U. P.	-----	43.14	41.98	28.50	21.50	25.40	38.60	57.20	62.00	64.30	62.30	55.90	44.00	24.70	19.30
Alpena........††	N. E.	-----	42.39	42.73	29.20	22.60	25.30	38.30	55.50	62.40	65.70	65.10	57.60	45.00	26.80	19.30
Grand Haven...	W.	-----	48.08	47.73	37.30	22.20	34.30	44.90	61.20	67.00	69.90	68.70	60.90	49.20	32.30	24.90
Nirvana and Reed City....‖	W.	47.15	44.85	44.65	31.36	25.25	29.06	42.18 ‖	62.10	66.95	67.98	66.43	56.81	43.15	24.61	19.87
Port Huron.....	B. & E.	-----	45.97	46.90	34.90	30.20	31.00	44.50	60.40[a]	66.30	68.80	67.70	60.20	48.10	28.90	21.80
Thornville......	B. & E.	49.09	48.11	48.75	35.85	31.10	32.94	47.33	67.12	70.40	71.73	69.61	61.22	47.77	28.45	21.53
Agr'l College.**	C.	48.29	¶ 46.88	47.28	37.10	29.19	35.50	45.87	64.30	67.60	68.04	68.58	55.83	46.23	27.52	22.07
Lansing, S. B. of H. ....**	C.	-----	49.14	49.25	37.10	31.60	34.34	47.50	66.03	69.79	72.27	70.70	61.71	48.99	29.17	21.80
Lansing, S. B. of H.	C.	-----	-----	48.94	36.81	31.62	34.19	47.46	65.48	69.44	71.69	70.38	61.19	48.64	28.78	21.65
Otisville........	C.	48.22	46.58	46.34	33.49	29.02[c]	30.17[d]	45.14[b]	64.19[a]	68.23[b]	68.71[a]	68.35	59.48[h]	46.57[g]	25.43[f]	17.26[e]
Battle Creek....	S. C.	51.46	50.17	50.61	38.79	33.26	35.63	50.28	67.63	72.84	73.43	71.06	62.15	49.03	29.62	23.59
Kalamazoo......	S. C.	49.19	47.57	48.21	36.27	30.21	33.68	46.69	61.40	68.94	71.65	70.98	60.28	47.42	27.34	20.64
Mendon.........	S. C.	48.60	47.08	47.75	37.07[b]	30.91[c]	33.77	46.84[b]	63.22[b]	68.17[e]	70.94	69.82	59.46[b]	47.17	25.24[c]	20.44[a]
Tecumseh.......	S. C.	49.43	46.59	47.75	35.23	30.91	33.31	46.27	64.22	68.99	70.62	69.40	60.26	46.54	26.83	20.40
Detroit..........	S. E.	49.87	48.42	48.70	37.00	32.30	33.23	46.07	61.20	69.10	70.80	69.30	61.60	48.40	30.15	22.20
Washington	S. E.	-----	46.44	45.91	33.44	28.64	30.45	44.28	61.94	66.61	68.56	66.81	58.63	45.33	26.08	20.06

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* The names of observers, their places of observation, and the counties in which these places are situated, are stated in Exhibit 26, page 404.

† The names of divisions, and the counties in each, are stated in Exhibit 1, page 257.

‡ This line is an average for only the 15 stations from which statements were received for every month of the year, and for which they are compiled by the method stated in the head of the table; it does not include the line for the Agricultural College or the first line for Lansing.

§ The numbers in the columns for 1878 and 1879 were determined from one-third the sum of observations at 7 A. M., 2 P. M., and 9 P. M. daily.

‖ The observations compiled in this line were made at Nirvana for 1878, 1879, and for the first months of 1880, to and including April 25, 1880. After that date they were made, with the same instruments, at Reed City.

¶ The average temperature stated for the Agricultural College for 1879 includes observations made at the office of the State Board of Health, Lansing, for November and December of that year. The Agricultural College is about three miles east from Lansing.

** The numbers stated in the line for the Agricultural College and in the first line for Lansing were determined from one-third the sum of observations at 7 A. M., 2 P. M., and 9 P. M. daily. These two lines are not included in the "average for 15 stations" line. The statements for the Agricultural College are taken from the Reports of the State Board of Agriculture.

†† At Alpena from January to May inclusive the observations were made at 7 A. M., 3 P. M., and 11 P. M., Washington mean time.

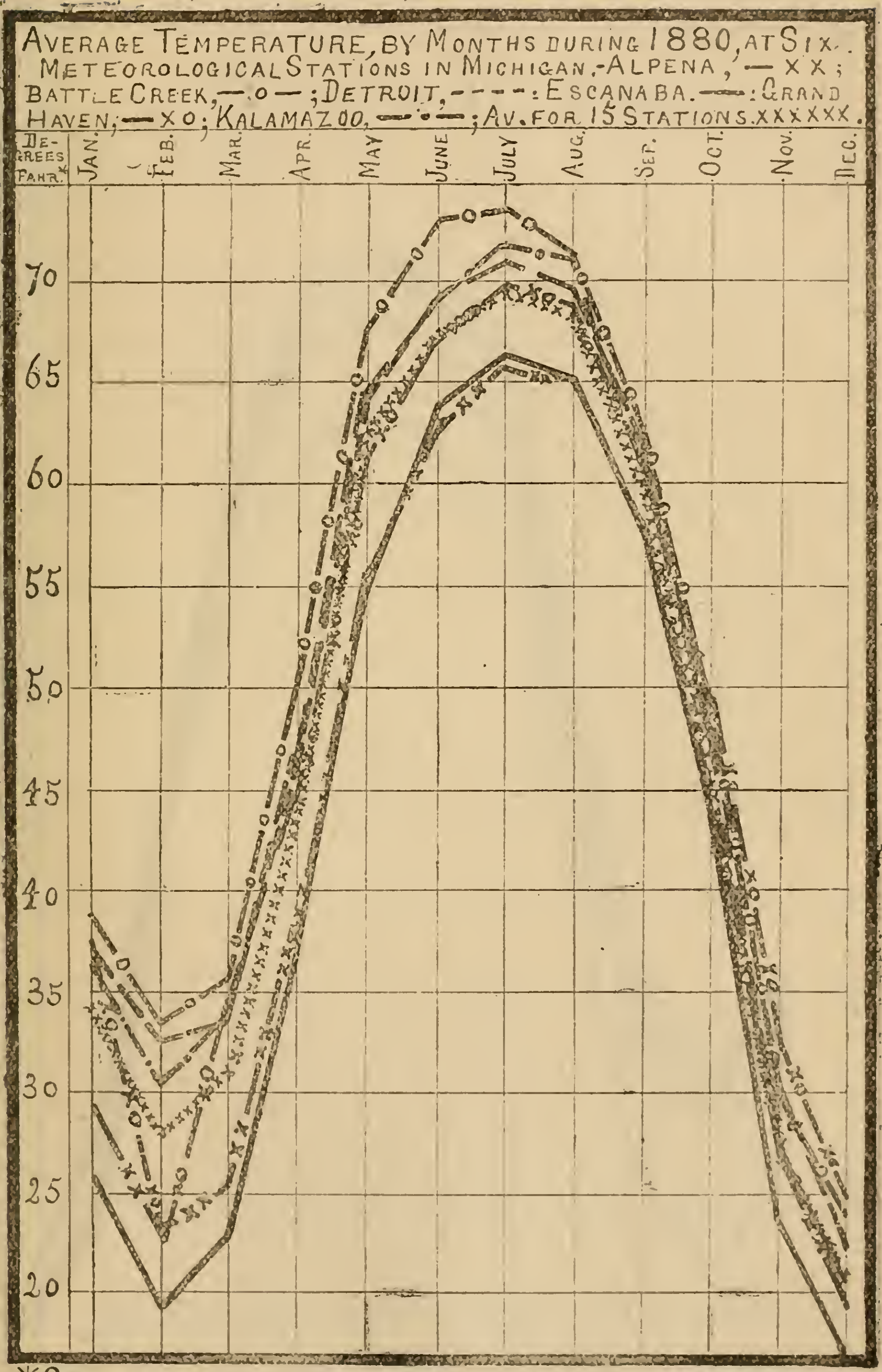
‡‡ The average for 15 stations in 1878 is 49.18°. §§ The average for 19 stations in 1879 is 46.82°.

[a], [b], [c]. In the columns from January to December, inclusive, the letters [a], [b], [c], etc., stand directly under the numbers from which they refer to the notes below:—

[a] For 30 days. [b] For 29 days. [c] For 28 days. [d] For 27 days. [e] For 26 days. [f] For 25 days. [g] For 24 days. [h] For 22 days.

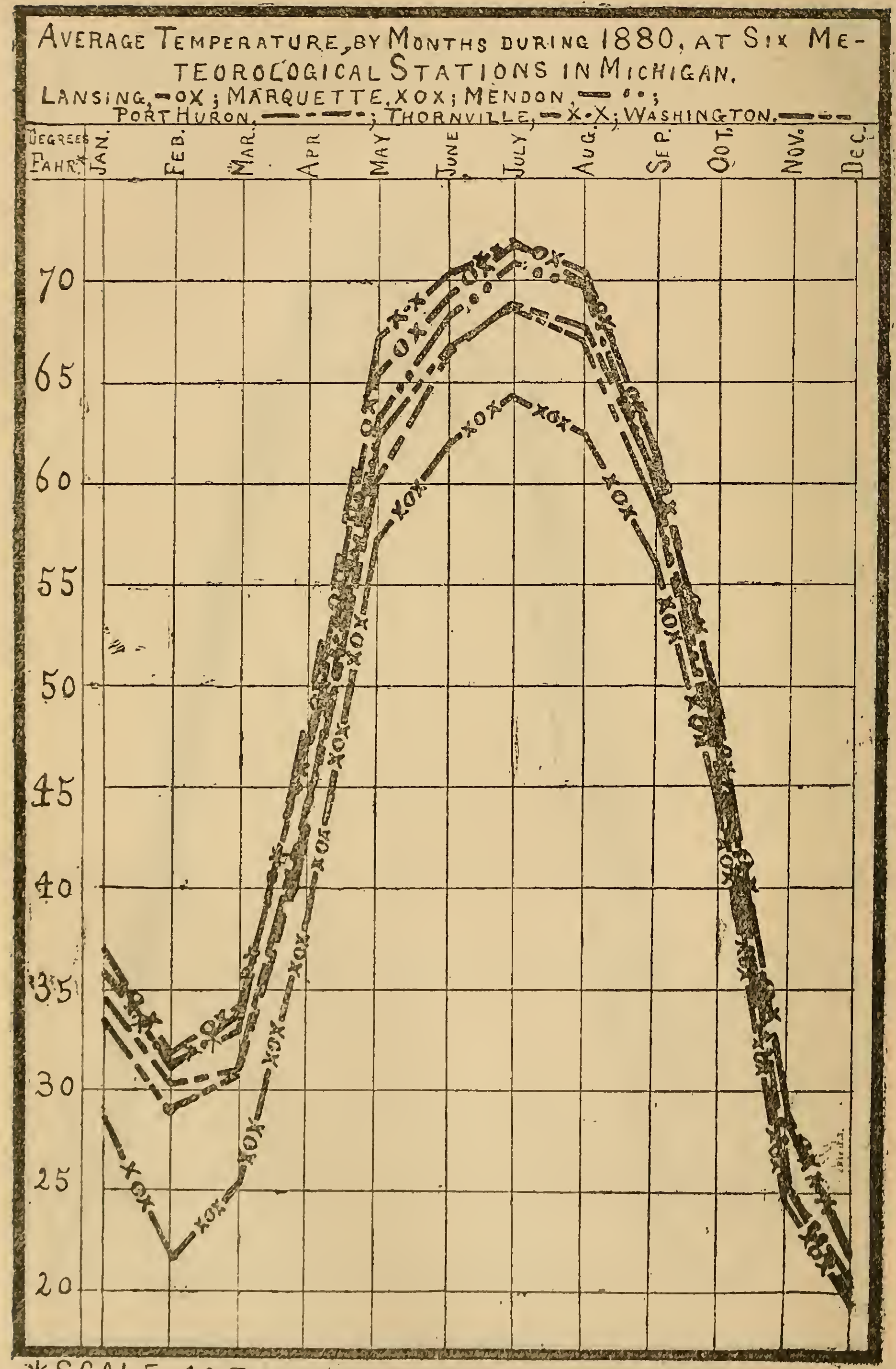
The lines for 12 representative stations in Table I. are graphically represented in Diagrams I. and II., pages 419 and 420. Comments on the diagrams are printed on page 411.

DIAGRAM I.—TEMPERATURE BY MONTHS IN 1880.



*SCALE, 10 DEGREES TO 1.1 INCHES VERTICALLY.
DESIGNED BY HENRY B. BAKER.

DIAGRAM II.—TEMPERATURE BY MONTHS IN 1880.



*SCALE, 10 DEGREES TO 1.1 INCHES VERTICALLY.

DESIGNED BY HENRY B. BAKER.

EXHIBIT 33.—*Comparison of the Extremes and the Range of Temperature (Degrees Fahr.) during the Year and during each month of the Year 1880, with the Average of the Extremes and of the Range for the Seven Years, 1873-9; also, Statement of the Extremes and of the Range for each of the Seven Years, 1873-9. Observations made with Registering Thermometers (except for the first two months of 1873, and for those two months with an ordinary Thermometer, at 7 A. M., 2 P. M., and 9 P. M.) Daily, by Prof. R. C. Kedzie, at the State Agricultural College,* near Lansing, Mich.*

YEAR AND MONTHS.	EXTREMES AND RANGES OF TEMPERATURE,—DEGREES F.																													
	1873.			1874.			1875.			1876.			1877.			1878.			1879.*			Average for 7 Years, 1873-9.†			1880.			In 1880 Higher (+), or Lower (-), than Av. for 7 Yrs, 1873-9.		
	Highest.	Lowest.	Range.	Highest.	Lowest.	Range.	Highest.	Lowest.	Range.	Highest.	Lowest.	Range.	Highest.	Lowest.	Range.	Highest.	Lowest.	Range.	Highest.	Lowest.	Range.	Highest.	Lowest.	Range.	Highest.	Lowest.	Range.	Highest.	Lowest.	Range.
YEAR	94	-30	124	101	-7	108	94	-33	127	96	-19	115	93	-14	107	98	-7	105	97	-18	115	†96	†-18	†114	94	-17	111	-2	+ 1	- 3
Average Month.	74	15	59	77	15	62	75	10	64	74	19	56	74	20	54	73	22	51	76	15	61	75	17	58	74	20	54	-1	+ 3	- 4
January	43	-30	73	59	-7	66	35	-13	48	65	6	59	52	-9	61	48	-4	52	44	-18	62	49	-11	60	62	9	53	+13	+20	- 7
February	49	-13	62	48	-1	49	42	-33	75	59	-1	60	56	10	46	55	-7	62	41	-6	47	50	-7	57	59	-2	61	+ 9	+ 5	+ 4
March	57	-12	69	67	8	59	75	-11	86	60	0	60	51	-14	65	72	18	54	66	4	62	64	-1	65	55	6	49	-9	+ 7	-16
April	82	24	58	68	3	65	80	0	80	74	16	58	81	18	63	75	29	46	81	12	69	77	15	63	76	20	56	-1	+ 5	- 7
May	84	27	57	96	21	75	89	24	65	89	31	58	90	26	64	77	29	48	91	25	66	88	26	62	87	40	47	-1	+14	-15
June	94	42	52	95	34	61	89	33	56	95	42	53	89	40	49	94	39	55	95	33	62	93	38	55	92	41	51	-1	+ 3	- 4
July	92	44	48	98	43	55	92	44	48	96	46	50	91	43	48	98	47	51	97	47	50	95	45	50	94	50	44	-1	+ 5	- 6
August	94	44	50	101	41	60	93	35	58	96	36	60	93	43	50	93	42	51	96	34	62	95	39	56	88	43	45	-7	+ 4	-11
September	89	26	63	95	30	65	94	26	68	80	36	44	85	38	47	92	31	61	85	27	58	89	31	58	88	30	58	-1	-1	0
October	79	16	63	76	16	60	77	18	59	75	19	56	87	26	61	82	21	61	87	15	72	80	19	62	76	24	52	-4	+ 5	-10
November*	56	1	55	70	3	67	60	2	58	62	12	50	55	4	51	52	15	37	75	13	62	61	7	54	62	-4	66	+ 1	-11	+12
December*	64	10	54	50	-6	56	70	-1	71	41	-19	60	58	13	45	36	-2	38	58	-3	61	54	-1	55	47	-17	64	-7	-16	+ 9

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* For November and December, 1879, the observations were made by Harry B. Turner, at the office of the State Board of Health, Lansing.

† For the seven years, 1873-9, the highest temperature was 101°, August 11, 1874; the lowest was -33°, February 8, 1875; and the range was 134° F.

TABLE II.—*Extremes of Temperature and Days of Month on which the Highest and for the Year 1880, at each of 28 Stations in Michigan,—as indicated by Daily Readings P. M., by Observers* for the State Board of Health, and for the U. S. Signal Service.*

Line Number.	STATIONS IN MICHIGAN.*	YEAR 1880.‡			JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.	
		Highest.	Lowest.	Range.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
1	At 23 Stations.‡	100°	-23°	123°	65°	-3°	67°	-12°	67°	-16°	78°	5°	90°	27°
2	Escanaba......§	86	-23	109	$42^{6,11}$	-3^{29}	40^{12}	-12^{6}	48^{21}	-16^{17}	65^{9}	$18^{7,8}$	$78^{5,19}$	36^{1}
3	Marquette....§	94	-20	114	56^{18}	-2^{12}	51^{17}	-8^{6}	$53^{22,31}$	-6^{10}	65^{9}	17^{7}	88^{25}	35^{13}
4	Minong	----	----	----	$40^{8,26}$	-11^{28}	44^{24}	-30^{6}	48^{31}	-25^{10}	60^{28}	0^{7}	--------	------
5	Alpena.........§	92	-15	107	$52^{4,11}$	5^{29}	58^{25}	-8^{2}	50^{21}	$-8^{10,15}$	66^{21}	14^{11}	87^{26}	27^{1}
6	Grand Haven.§	84	-3	87	57^{9}	12^{29}	58^{26}	$9^{1,19}$	59^{31}	9^{8}	66^{14}	24^{12}	83^{25}	$40^{1,15}$
7	Nirvana and Reed City..	93	-16	109	52^{9}	6^{15}	54^{25}	-10^{9}	58^{31}	0^{15}	73^{14}	22^{7}	86^{25}	41^{14}
8	Port Huron...§	89	-14	103	58^{11}	16^{29}	59^{28}	$6^{2,6}$	57^{5}	$11^{8,10,25}$	73^{14}	21^{12}	85^{18}	29^{1}
9	Thornville....§	92	-12	104	61^{11}	15^{29}	64^{28}	2^{6}	57^{31}	10^{8}	77^{14}	21^{11}	$90^{7,25}$	32^{1}
10	Ag'l College..§	94	-17	111	62^{11}	9^{31}	$59^{26,28}$	-2^{1}	55^{31}	6^{7}	76^{14}	20^{8}	87^{25}	$40^{1,4}$
11	Hastings........	90	----	----	60^{27}	15^{29}	57^{28}	1^{2}	62^{31}	10^{8}	79^{14}	$29^{7,8,11}$	$86^{7,18,24}$	$45^{1,14}$
12	Ionia............	94	-11	105	51^{9}	11^{29}	56^{17}	-3^{1}	54^{31}	4^{8}	75^{14}	24^{10}	84^{26}	$35^{14,15}$
13	Lansing........§	93	-18	111	62^{11}	9^{31}	64^{26}	3^{1}	60^{31}	$8^{7,8}$	$78^{10,14}$	$23^{10,11}$	89^{25}	39^{14}
14	Otisville ......§	100	-17	117	65^{12}	4^{29}	65^{29}	$1^{2,20}$	58^{24}	7^{17}	78^{15}	5^{8}	$90^{8,26}$	33^{14}
15	Winfield.......	----	----	----	------	-------	--------	------	------	---------	------	-------	--------	------
16	Benton Harbor	95	-7	102	61^{11}	20^{29}	67^{27}	11^{20}	67^{4}	15^{8}	78^{14}	$30^{8,10,11}$	$87^{7,25}$	47^{16}
17	Niles............	95	-21	116	61^{11}	15^{24}	66^{27}	$8^{2,6}$	60^{27}	15^{8}	77^{18}	$30^{7,8}$	88^{7}	46^{1}
18	Adrian.........§	95	-16	111	63^{11}	19^{29}	63^{28}	7^{2}	60^{4}	13^{8}	74^{13}	$26^{8,11}$	88^{7}	35^{1}
19	Ann Arbor.¶	90	-14	104	59^{11}	18^{29}	61^{28}	9^{2}	54^{4}	10^{8}	76^{14}	25^{11}	86^{25}	39^{1}
		----	----	----	------	-------	--------	------	------	------- -	------	-------	--------	------
20	Battle Creek.§	93	-13	106	$62^{9,12}$	$16^{29,30}$	61^{28}	3^{3}	$61^{5,6}$	9^{8}	74^{15}	21^{12}	87^{26}	$35^{2,4}$
21	Coldwater......	91	-16	107	56^{3}	23^{15}	61^{28}	4^{2}	59^{21}	13^{8}	72^{13}	20^{11}	85^{25}	43^{1}
22	Hillsdale.......	90	-19	109	55^{11}	$15^{1,29}$	60^{28}	6^{2}	58^{4}	$10^{8,17}$	76^{14}	24^{11}	82^{7}	43^{1}
23	Hudson	----	----	----	60^{11}	17^{24}	$58^{25,27,28}$	1^{2}	58^{4}	12^{8}	78^{14}	25^{11}	89^{25}	41^{1}
24	Kalamazoo....§	94	-20	114	63^{11}	10^{31}	62^{27}	1^{1}	61^{4}	11^{7}	77^{14}	22^{10}	89^{25}	$40^{13,14}$
25	Mendon........	92	-17	109	57^{11}	17^{1}	$62^{26,27}$	$8^{2,4}$	$58^{4,27}$	13^{8}	77^{14}	26^{8}	86^{7}	41^{1}
26	Tecumseh	90	-13	103	57^{11}	18^{1}	$59^{27,28}$	3^{2}	54^{31}	16^{13}	77^{14}	25^{11}	85^{26}	35^{1}
27	Ypsilanti	----	----	----	62^{11}	18^{29}	61^{28}	10^{19}	56^{4}	12^{8}	------	-------	84^{8}	43^{1}
28	Detroit.........§	93	-11	104	57^{11}	19^{29}	60^{28}	$11^{2,5}$	53^{4}	11^{8}	74^{14}	$24^{11,12}$	$85^{7,18}$	33^{1}
29	Washington....	90	-13	103	55^{11}	10^{29}	61^{28}	-2^{6}	53^{31}	4^{1}	70^{14}	23^{11}	$85^{7,25,26}$	35^{1}

NOTE.—The small figures above and at the right of numbers denoting the degrees of temperature state the day or days of the month on which the highest or the lowest temperature occurred.

* The names of observers, etc., are stated in Exhibit 26, page 404.

‡ The line number 1, and the three columns for the year 1880 relate only to the 23 stations from which observations were received for every month of the year.

§ Determined by daily readings of registering thermometers made and recorded at 7 A. M., for the preceding calendar day. But at Otisville the observations were recorded for the calendar day on which they were made; and at the stations of the U. S. Signal Service the registering thermometers were *the Lowest Temperatures occurred, by Months of the Year 1880; also Extremes and Range of Registering Thermometers, or by Observations made Daily at 7 A. M., 2 P. M., and 9*

JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		Line Number.
Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	
94°	37°	100°	43°	95°	39°	93°	26°	90°	24°	67°	-12°	55°	-23°	1
$84^{20, 21}$	39^{1}	$83^{12,13}$	$48^{27,28}$	86^{18}	43^{5}	84^{5}	34^{30}	64^{5}	24^{19}	52^{3}	-9^{22}	40^{5}	-23^{28}	2
91^{22}	37^{3}	93^{9}	43^{28}	88^{7}	42^{5}	$81^{1,2}$	36^{29}	77^{10}	26^{18}	56^{9}	-6^{22}	38^{5}	-20^{28}	3
--------	-------	-------	------	---------	----------	83^{1}	33^{8}	-------	--------	-----	-------	28^{4}	-24^{25}	4
92^{23}	37^{3*}	90^{12}	47^{7}	$88^{1, 8}$	41^{16}	85^{5}	35^{30}	76^{11}	$26^{19, 28}$	57^{5}	-4^{22}	50^{5}	-15^{29}	5
81^{23}	48^{2}	84^{13}	50^{21}	$81^{18,27,31}$	46^{3}	79^{1}	34^{30}	73^{10}	31^{29}	58^{3}	0^{26}	48^{5}	-3^{29}	6
92^{24}	46^{1}	93^{13}	51^{21}	92^{23}	50^{3}	86^{1}	36^{29}	78^{10}	25^{24}	$60^{2,3}$	-12^{26}	41^{11}	-16^{28}	7
88^{24}	$47^{1,2,8}$	87^{9}	51^{21}	89^{27}	48^{16}	85^{1}	34^{30}	$74^{9,10}$	27^{19}	$59^{3,5}$	-6^{22}	50^{5}	-14^{30}	8
$91^{24, 26}$	48^{8}	$92^{9,13}$	51^{3}	90^{27}	$46^{4, 16}$	90^{1}	37^{30}	$75^{10,11}$	28^{19}	61^{5}	-2^{22}	48^{5}	-12^{29}	9
92^{12}	41^{1}	$94^{13,14}$	$50^{20,21}$	$88^{23, 27}$	43^{3}	88^{1}	29^{30}	76^{10}	$24^{18, 27}$	62^{3}	-4^{21}	47^{4}	-17^{28}	10
$89^{11,21,23}$	51^{1}	90^{13}	56^{21}	$90^{24, 27}$	52^{3}	84^{1}	36^{14}	-------	--------	-----	-------	------	-----	11
$86^{21, 23}$	$50^{6,7,23}$	94^{13}	60^{18}	84^{26}	$58^{15,16,17,25}$	86^{18}	34^{30}	78^{10}	29^{18}	55^{3}	-6^{26}	40^{5}	-11^{29}	12
92^{11}	46^{1}	93^{13}	52^{20}	93^{27}	$49^{2, 3, 15}$	90^{1}	34^{29}	81^{10}	27^{18}	67^{3}	-3^{21}	$48^{4, 5}$	-18^{29}	13
93^{25}	38^{3}	100^{11}	45^{2}	93^{28}	39^{16}	93^{2}	26^{28}	80^{11}	$24^{19,24,25}$	62^{4}	-9^{22}	51^{1}	-17^{20}	14
92^{24}	52^{7}	92^{13}	53^{21}	88^{27}	50^{3}	87^{1}	55^{30}	79^{9}	26^{24}	58^{3}	$-3^{22,26}$	46^{5}	-16^{29}	15
$89^{11, 23}$	51^{1}	94^{13}	61^{19}	$95^{23, 24}$	56^{3}	85^{18}	41^{30}	90^{10}	33^{29}	65^{3}	4^{19}	40^{4}	-7^{29}	16
93^{11}	49^{1}	95^{13}	54^{20}	92^{18}	55^{3}	86^{3}	36^{30}	$78^{9,10}$	28^{29}	62^{3}	-5^{21}	$41^{3,14}$	-21^{29}	17
91^{11}	50^{2}	95^{13}	53^{21}	91^{27}	$52^{4, 16}$	89^{1}	35^{30}	76^{10}	$28^{19, 25}$	59^{5}	-3^{22}	50^{5}	-16^{29}	18
$87^{11, 24}$	52^{14}	90^{13}	56^{20}	87^{27}	55^{3}	86^{1}	36^{30}	73^{10}	29^{19}	57^{3}	-5^{22}	45^{5}	-14^{29}	19
--------	-------	149^{11}	44^{21}	146^{24}	38^{4}	157^{3}	26^{30}	$130^{10,11}$	20^{19}	116^{9}	-11^{22}	91^{4}	-21^{30}	
91^{11}	47^{2}	$93^{13,14}$	50^{21}	$86^{19,24,28}$	$48^{4, 16}$	85^{2}	34^{30}	76^{11}	27^{19}	60^{4}	-2^{26}	55^{5}	-13^{28}	20
86^{24}	$53^{1, 7}$	$91^{12,13}$	$55^{20,21}$	88^{27}	53^{4}	86^{1}	34^{30}	76^{10}	28^{19}	60^{3}	5^{22}	50^{5}	-16^{29}	21
86^{11}	50^{2}	90^{13}	55^{21}	87^{27}	$55^{3, 4}$	83^{1}	36^{30}	76^{10}	27^{19}	58^{3}	$-3^{19,22}$	46^{5}	-19^{29}	22
92^{11}	53^{14}	-------	------	88^{18}	57^{16}	83^{1}	$43^{23,29,30}$	73^{11}	28^{19}	57^{3}	-5^{22}	40^{5}	-16^{29}	23
91^{11}	48^{1}	94^{13}	$52^{19,20}$	91^{27}	49^{2}	85^{1}	37^{29}	77^{10}	25^{18}	61^{3}	-2^{21}	48^{4}	-20^{28}	24
$89^{11, 22}$	52^{1}	92^{13}	56^{20}	89^{27}	53^{16}	83^{1}	34^{30}	78^{10}	26^{19}	61^{3}	-2^{22}	40^{5}	-17^{29}	25
$86^{12, 24}$	53^{11}	90^{13}	55^{21}	87^{27}	51^{4}	85^{1}	35^{30}	76^{10}	27^{19}	57^{2}	-6^{22}	44^{5}	-13^{29}	26
$87^{11, 12}$	51^{14}	-------	------	87^{22}	48^{4}	82^{2}	42^{30}	$73^{9,11}$	29^{19}	68^{2}	-3^{22}	-----	----	27
91^{11}	49^{2}	93^{13}	52^{21}	88^{27}	48^{16}	87^{1}	35^{30}	75^{10}	$30^{24, 28}$	59^{5}	0^{22}	46^{5}	-11^{29}	28
89^{11}	49^{14}	90^{13}	56^{29}	88^{27}	52^{3}	84^{2}	37^{30}	75^{10}	26^{28}	57^{9}	-9^{22}	38^{5}	-13^{29}	29

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recorded and set each day at 11 P. M., Washington time. For stations not indicated by this mark (§), the extremes were determined from the 7 A. M., 2 P. M., and 9 P. M. observations.

‖ The observations in this line were made at Nirvana to and including April 25, 1880. After that date they were made, with the same instruments, at Reed City about 10 miles distant from Nirvana.

¶ "The maximum thermometer readings," (in the lower line for Ann Arbor), "were taken with a solar-radiation thermometer. The bulb was blackened and inclosed in a glass receiver vacuum, and the instrument was exposed horizontally, about four feet from the ground, to the direct rays of the sun. The minimum observations were taken with an extra sensitive thermometer supported four inches above the turf at a considerable distance from all buildings."—PROF. M. W. HARRINGTON, *Ann Arbor, Mich.*

MONTHLY AND ANNUAL EXTREMES AND RANGE OF TEMPERATURE.

At the Agricultural College the highest reported temperature in 1880 was two degrees lower than the average highest for the preceding seven years; and the lowest, one degree higher than the average lowest for those years. The highest in 1880 was 7° lower than the highest for the seven years, 1873–9; and the lowest 16° higher than the lowest for those years. The extremes in 1880 were 94° F. and –17° F. In January, 1880, the highest temperature was 13° higher than the average highest, and the lowest was 20° higher than the average lowest for the seven preceding Januarys. In December, 1880, the highest temperature was 7° lower than the average highest, and the lowest temperature was 16° lower than the average lowest for the seven preceding Decembers.

AVERAGE DAILY RANGE OF TEMPERATURE.

By Exhibit 34, below, it may be seen that the average daily range of temperature for 12 stations in 1880 was less than the average for 6 stations in 1879 in every month except March, in which month it was .51° greater. The average daily range at each of 12 stations in 1880 is stated in Table III., page 426. The statements for each of these stations are graphically represented in Diagram III., page 425.

In Diagram III., page 425, the line of × × ×'s representing the average daily range of temperature at 12 stations, and the –× line representing the same at Otisville may profitably be compared with the line representing intermittent fever, in Diagram 3, page 400.

EXHIBIT 34.—*Comparison by Year and Months of the Average Daily Range of Temperature, by Registering Thermometers, at 12 Stations in 1880 with the Average at 6 Stations in 1879.*[*]

YEARS, ETC.	AVERAGE DAILY RANGE OF TEMPERATURE—DEGREES FAHR.												
	Annual Av.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 6 Stations in 1879..........	19.22	17.12	17.64	16.95	21.43	23.58	21.87	20.92	22.21	19.06	18.61	16.00	15.23
Av. for 12 Stations in 1880..........	17.03	15.55	17.47	17.46	18.15	20.86	18.61	18.50	17.97	17.69	16.37	14.52	11.26
In 1880 **Greater** than in 1879....	....	------	------	.51	------	------	------	------	------	------	------	------	------
In 1880 **Less** than in 1879...	2.19	1.57	.17	------	3.28	2.72	3.26	2.42	4.24	1.37	2.24	1.48	3.97

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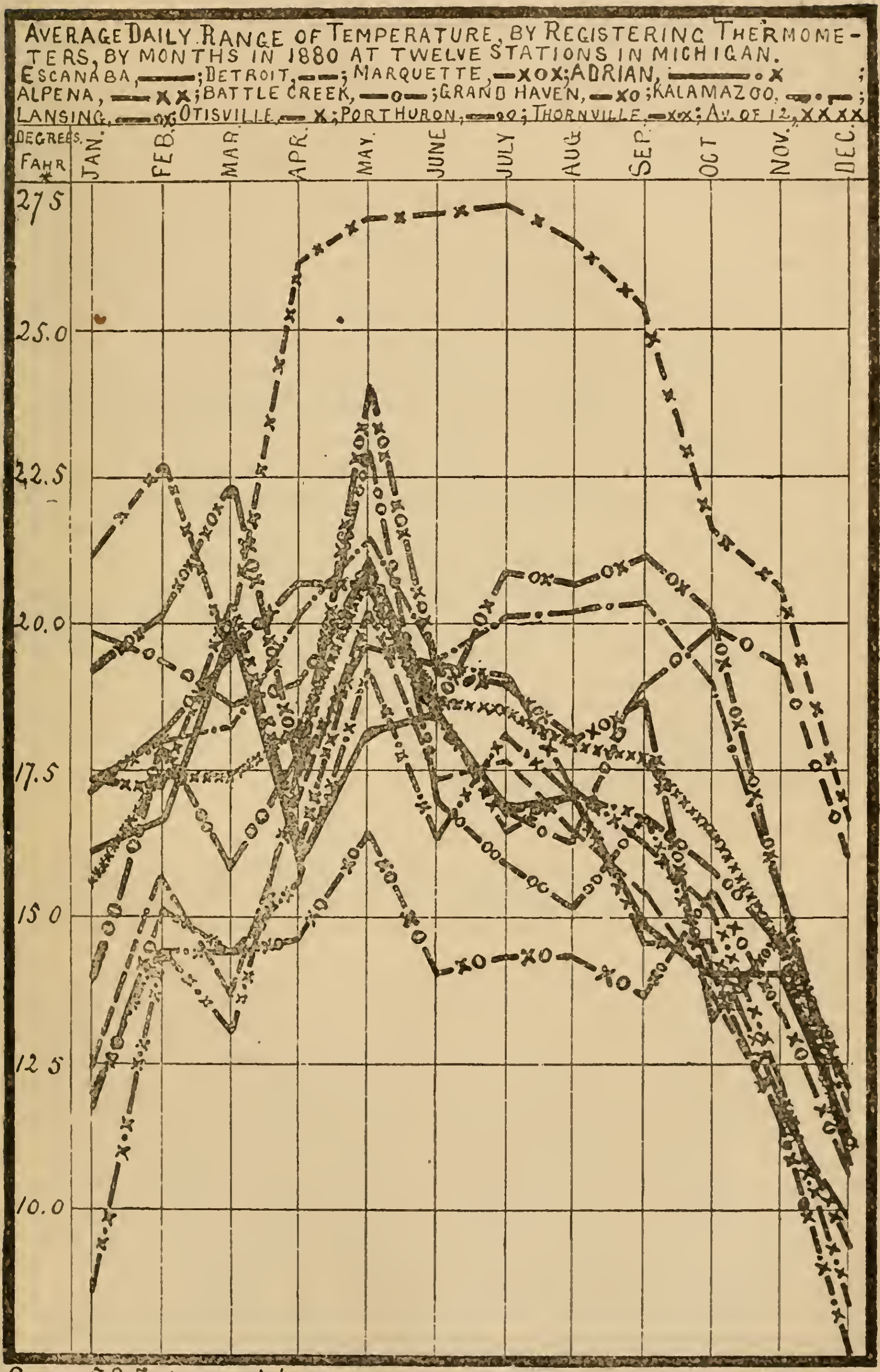
[*] Six of the stations, namely, Marquette, Grand Haven, Lansing, Otisville, Battle Creek, and Detroit, were the same for both years; and six, Escanaba, Alpena, Port Huron, Thornville, Adrian, and Kalamazoo, were included in the average for 1880, but not in that for 1879.

DIAGRAM III.—RANGE OF TEMPERATURE, MONTHS IN 1880.



SCALE, 5° FAHR. TO 1.6 INCH, VERTICALLY.

Drawn by H. B. Turner

Designed by Henry B. Baker.

TABLE III.—*Average Daily Range of Temperature, by Registering Thermometers during the Year and during each Month of the Year 1880, at each of Twelve Stations in Michigan, and Average for the Twelve Stations.*

STATIONS IN MICHIGAN.*	Division of the State.†	AVERAGE DAILY RANGE OF TEMPERATURE,—DEGREES FAHR.													
		YEAR.		MONTHS, 1880.											
		1879.	1880.	Jan.	Feb.	Mar.	Apr.	May.	J'ne.	J'ly.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 12 Stations..	....	‡	17.03	15.55	17.47	17.46	18.15	20.86	18.61	18.50	17.97	17.69	16.37	14.52	11.26
Escanaba............	U. P.	.....	16.12	16.16	16.69	19.97	15.97	18.13	18.43	16.84	17.03	14.90	14.00	14.00	11.29
Marquette..........	U. P.	17.99	18.14	19.19	20.21	22.26	17.43	23.84	19.13	18.94	18.03	18.70	13.23	14.70	12.06
Alpena..............	N. E.	.....	16.13	17.29	17.17	20.29	16.23	20.13	18.57	16.45	17.10	14.53	14.61	11.87	9.35
Grand Haven.......	W.	13.75	13.98	11.73	15.10	14.32	14.60	16.42	14.00	14.29	14.29	13.60	15.48	13.33	10.61
Port Huron..........	B. & E.	.....	16.18	13.87	17.86	15.81	17.67	22.94	16.97	15.90	15.10	16.70	15.77	14.53	11.03
Thornville...........	B. & E.	.....	15.03	8.60	14.41	13.03	17.53	19.60	19.33	19.06	17.19	16.17	15.06	12.07	8.32
Lansing...............	C.	20.83	18.61	17.10	18.17	19.45	20.63	20.65	18.43	20.81	20.65	21.17	20.16	15.33	10.74
Otisville.......	C.	27.54	23.41	21.18	22.69	19.55	26.18	26.89	26.95	27.08	26.48	25.32	21.56	20.52	16.53
Adrian	S. C.	.....	14.71	11.90	14.34	14.29	15.55	19.19	16.30	18.12	17.00	16.57	14.16	11.53	7.55
Battle Creek........	S. C.	18.61	18.60	19.84	19.28	18.55	18.90	21.06	18.50	16.68	16.26	18.93	19.87	19.30	16.03
Kalamazoo..........	S. C.	.....	18.42	17.29	18.00	18.23	20.13	21.35	19.42	20.13	20.19	20.28	18.92	15.45	11.68
Detroit...............	S. E.	16.60	15.07	12.48	15.72	13.71	16.97	20.13	17.30	17.65	16.32	15.37	13.67	11.63	9.87

NOTE.—Graphic representations of statements in Table III., are given in Diagram No. IV., page 429.

* The names of observers, their places of observation, and the counties in which these places are situated are stated in Exhibit 26, page 404.

† For counties in each division, see Exhibit 1, page 257.

‡ The average for the six stations in 1879 is 19.22°.

HUMIDITY OF THE ATMOSPHERE.

The subject of humidity of the atmosphere is here studied in two very different ways: first the facts respecting the absolute humidity are shown in tables, diagrams, etc., then those respecting relative humidity are similarly exhibited.

Meteorologists have generally paid much more attention to the subject of relative humidity than to that of the absolute humidity; probably for the reason that with respect to the precipitation of rain or snow they considered the relative humidity of the most importance, though some have claimed that it had greater influence on health than has absolute humidity. Heretofore, and elsewhere, the writer has given reasons why the absolute humidity has very important relations to health, and especially to diseases of the lungs and air-passages, and to certain contagious diseases which prevail most when the air-passages are irritated by breathing air unusually cold and dry. There is reason to believe that the air exhaled from the human lungs is uniformly saturated with vapor of water, at about the uniform temperature of the body, say at 98° F.; and consequently that the quantity of vapor thus exhaled is nearly the same at all seasons of the year and in all climates; therefore it makes a great difference in the effects upon the lining of the lungs and air-passages whether the air inhaled contains nearly sufficient moisture to saturate it at 70° F. (about eight grains of vapor in each cubic foot of air) or only sufficient to saturate it at a much lower temperature, at the freezing point for instance, when it will contain only about two grains in each cubic foot of air.

In former years the evidence has been that June was the most healthful month, and it is a month when people are much exposed to out-door air. The air here in June has usually been about three-fourths saturated with vapor of water, and contained nearly six grains of vapor in each cubic foot of air. If June is a standard month (all diseases considered) then we may conclude that about six grains of vapor of water in each cubic foot of air we breathe is (all diseases considered) a most desirable quantity. In this connection two facts are worthy of note: 1, that in 1880 the month of May was the most healthful month, in Michigan, according to the evidence in the first line in Exhibit 7 page 309, graphically shown in the line of × × ×'s in Diagram 5 page 390; 2, that the month of May 1880 was unusually warm and moist, as shown in Exhibits 31 and 32, page 417, and Exhibits A, below, and 35, page 428, and Table IV., page 431.

The quantity of vapor of water which air will hold when saturated being, as is known, dependent upon and varying greatly with the temperature of the air, its per cent of saturation,—relative humidity,—is not a per cent of some fixed quantity, but is a per cent of a quantity which varies with every degree of temperature, while the vapor exhaled from the human lungs seems to be nearly a fixed quantity. It would, therefore, seem to be a much more simple study to learn the relations of absolute than of relative humidity to diseases connected with the lungs and air passages; and it would seem that there is greater probability of there being relations of cause and effect between absolute humidity and such diseases than between relative humidity and those diseases.

EXHIBIT A.—*Absolute Humidity (Grains of Water in each Cubic Foot of Air) by Months in 1880, Compared with the Average by Months for the 17 Years 1864–80; also Comparisons of the number of Grains Required to Saturate each Cubic Foot of Air beyond the number of Grains of Water already present; and the Temperature of the Dew Point. Observations made at 7 A. M., 2 P. M., and 9 P. M., Daily at the State Agricultural College, near Lansing, Michigan, and the Computations made from Glaisher's Tables by Prof. R. C. Kedzie, M. D.*

		GRAINS OF VAPOR IN A CUBIC FOOT OF AIR.—TEMPERATURE IN DEGREES FAHR.												
		Annual Av.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
17 years, '64-80.	Av. Absolute Humidity (Grs.)	3.40	1.38	1.49	1.84	2.63	4.10	5.73	6.11	5.83	4.82	3.26	2.07	1.53
	Required to Saturate each Cubic Foot of Air	----	.36	.37	.55	1.14	1.59	1.89	1.78	1.81	1.02	.85	.58	.36
	Temperature of Dew Point	----	16.00°	18.37°	24.40°	35.45°	49.50°	59.52°	61.46°	60.23°	54.00°	41.14°	28.15°	19.03°
Year 1880.	Av. Absolute Humidity (Grs.)	3.62	2.14	1.73	1.74	2.61	5.82	5.78	6.10	6.29	4.89	3.02	1.76	1.40
	Required to Saturate each Cubic Foot of Air	----	.66	.41	.97	1.15	.83	1.75	1.43	1.47	.29	.74	.24	.29
	Temperature of Dew Point	----	29.5°	23°	23.5°	35.5°	60.2°	60°	61.6°	62.6°	51.3°	39.7°	23.3°	16.9°

From the Exhibit A, compiled by Prof. Kedzie, it appears that the average absolute humidity of the air was slightly greater in 1880 than the annual average of the preceding 17 years, much greater than the average of the preceding years in the months of January and May, and somewhat greater in February and August; and that it was less than the average of the preceding years in the months of March, October, November, and December.

By comparing the absolute humidity in 1880 at the Agricultural College as given by Prof. Kedzie in Exhibit A with the statements for other stations shown in Table IV., it will be seen that at no other station than at the College was the absolute humidity greater in May than in June; though the average at all stations is considerably greater in May 1880 than the average for May for the seventeen years at the Agricultural College. A line to Prof. Kedzie about the anomaly of absolute humidity at the Agricultural College in May, 1880, elicited a reply as follows:

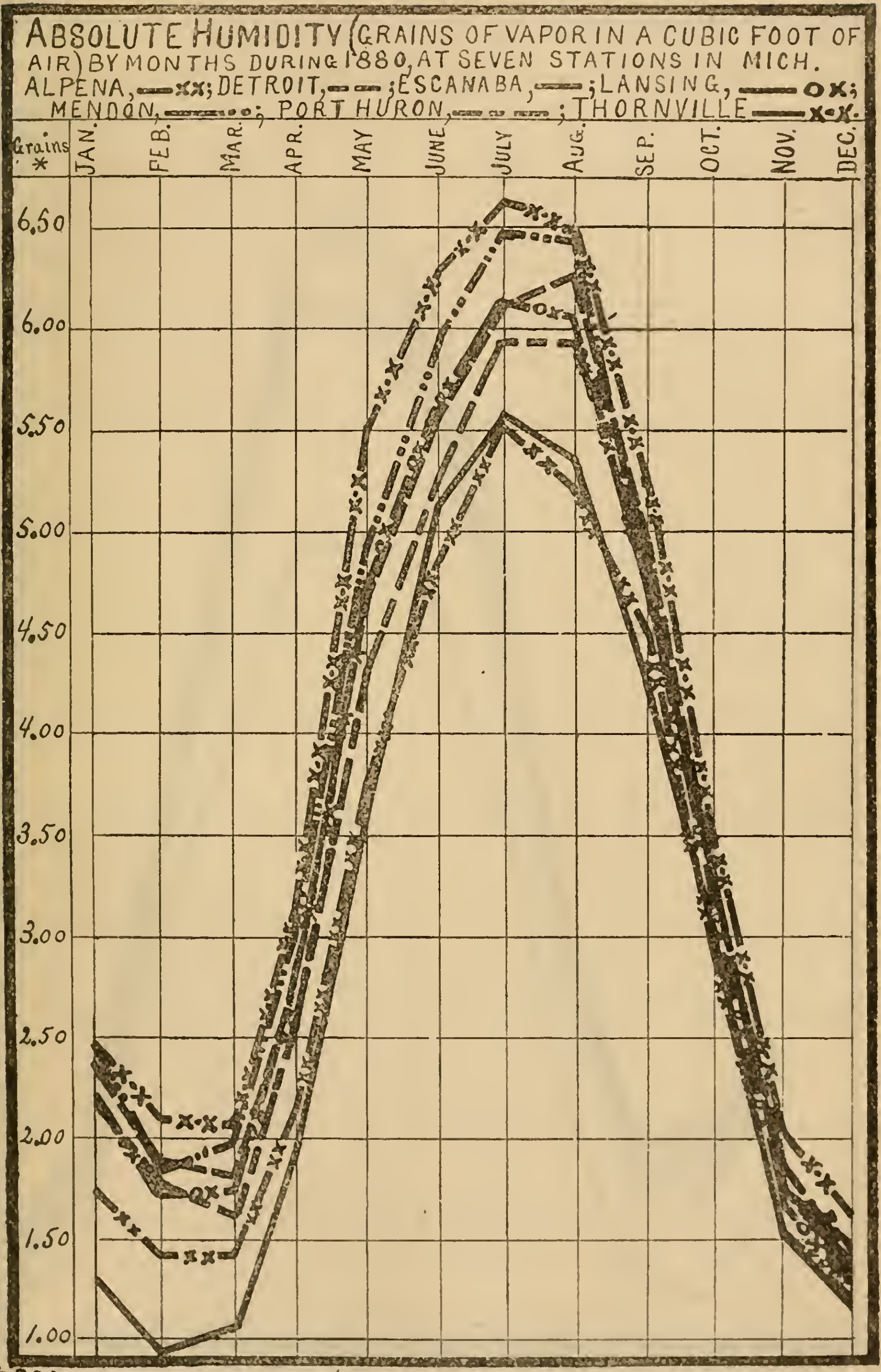
> "If you remember it was a very anomalous month, with excessive rainfall, and the last half of April preceding was unusually wet, more than 4 inches of rain having fallen in the last two weeks of April, while the rainfall in May was .55 inch more than in June, which is unusual. I think the high dew point for May and excessive precipitation of moisture are in the same line as the excess of absolute moisture. You can compare the rainfall of other stations and see if the same excess of watery vapor is there exhibited."

EXHIBIT 35.—*Comparison by Year and Months of the Average Absolute Humidity (Grains of Vapor in a Cubic Foot of Air) at 14 Stations in 1880, with the Average at 16 Stations in 1879.**

YEARS, ETC.	GRAINS OF VAPOR IN A CUBIC FOOT OF AIR,—(Absolute Humidity.)												
	Annual Av.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 16 Stations in 1879	3.43	1.31	1.23	1.93	2.64	3.94	5.09	6.30	5.58	4.40	4.61	2.46	1.70
Av. for 14 Stations in 1880	3.44	2.13	1.68	1.70	2.69	4.56	5.57	6.09	5.97	4.74	3.18	1.70	1.32
In 1880 **Greater** than in 1879	.01	.82	.45	------	.05	.62	.48	------	.39	.34	------	------	------
In 1880 **Less** than in 1879	------	------	------	.23	------	------	------	.21	------	------	1.43	.76	.38

*Twelve of the stations, namely, Marquette, Alpena, Grand Haven, Nirvana, Port Huron, Thornville, Lansing, Otisville, Kalamazoo, Mendon, Tecumseh, and Detroit, were the same for both years; four, Petoskey, Niles, Battle Creek, and Woodmere Cemetery (near Detroit), were included in the average for 1879, but not in that for 1880; and two, Escanaba and Washington, were included in the average for 1880, but not in that for 1879.

DIAGRAM NO. IV.—ABSOLUTE HUMIDITY, BY MONTHS, IN 1880.



* SCALE, ONE GRAIN OF VAPOR (IN A CUBIC FOOT OF AIR) TO 1.09 OF AN INCH, VERTICALLY. DESIGNED BY HENRY B. BAKER. DRAWN BY H. B. TURNER.

DIAGRAM NO. V.—ABSOLUTE HUMIDITY, BY MONTHS, IN 1880.

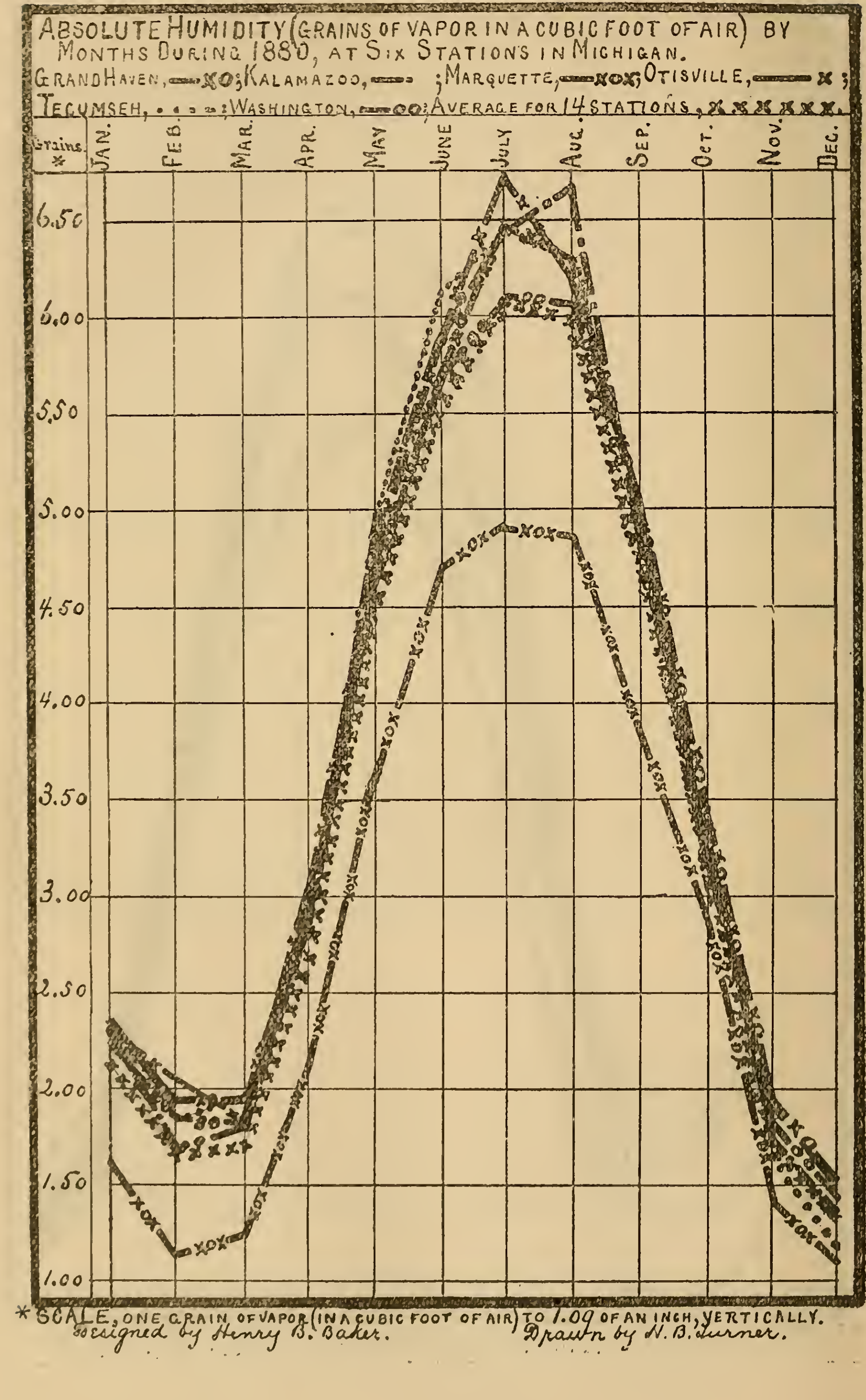


TABLE IV.—*The Average Number of Grains of Vapor of Water in a Cubic Foot of Air (Absolute Humidity), for Months and Year 1880, at 15 Stations in Michigan,—Average of Observations made Daily at 7 A. M., 2 P. M., and 9 P. M., by Observers* for the State Board of Health, and for the U. S. Signal Service.*

STATIONS IN MICHIGAN.*	Division of the State.†	GRAINS OF VAPOR IN A CUBIC FOOT OF AIR.—(ABSOLUTE HUMIDITY.)														
		YEAR.			MONTHS, 1880.											
		1878.	1879.	1880.	Jan.	Feb.	Mar.	Apr.	May.	J'ne.	J'ly.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 14 Stations‡	......	[a]	[b]	3.44	2.13	1.68	1.70	2.69	4.56	5.57	6.09	5.97	4.74	3.18	1.70	1.32
Escanaba*	U. P.†	.....	.....	2.91	1.30	0.92	1.08	1.97	3.61	5.15	5.58	5.37	4.25	2.97	1.53	1.15
Marquette	U. P.	.....	2.90	2.79	1.62	1.13	1.24	2.13	3.67	4.71	4.91	4.86	3.82	2.84	1.40	1.10
Alpena	N. E.	.....	2.93	3.03	1.74	1.43	1.43	2.17	3.77	4.87	5.53	5.21	4.50	2.92	1.56	1.23
Grand Haven	W.	.....	3.48	3.76	2.36	1.91	1.95	2.89	4.63	5.70	6.48	6.30	4.97	3.36	1.94	1.53
Nirvana and Reed City§	W.	3.40	3.13	3.11	1.85	1.42	1.14	[d]2.40	4.51	5.30	5.69	5.45	4.44	2.72	1.22	0.88
Port Huron	B. & E.	.....	3.23	3.41	2.17	1.75	1.62	2.57	4.31	5.28	5.96	5.93	4.84	3.31	1.84	1.36
Thornville	B. & E.	3.87	3.76	3.92	2.49	2.12	2.07	3.17	5.51	[e]6.30	6.64	6.47	5.22	3.44	2.01	1.63
Lansing	C.	.....	3.44	3.49	2.22	1.74	1.75	2.76	4.76	5.60	6.12	6.06	4.72	3.16	1.67	1.30
Otisville	C.	3.76	3.59	3.72	2.31	[f]2.06	[e]1.81	3.01	4.80	5.86	6.74	[d]6.21	[g]5.05	[e]3.29	[h]1.91	[i]1.54
Battle Creek	S. C.	3.67	3.67	[c]	2.47	[g]2.05	[j]2.01	[k]3.60	.....	6.02	6.38	[j]6.28	5.01	3.39	[e]1.88	1.34
Kalamazoo	S. C.	3.62	3.44	3.65	2.32	1.70	1.80	2.82	4.89	5.86	6.45	6.66	4.86	3.27	1.73	1.38
Mendon	S. C.	3.78	3.60	3.80	[l]2.48	1.86	1.93	3 01	[l]4.94	[l]5.96	6.48	6.41	[d]4.82	3.29	1.75	1.46
Tecumseh	S. C.	3.87	3.47	3.68	2.37	1.81	1.96	3.04	4 98	6.13	6.44	6.30	4.99	3.34	1.63	1.15
Detroit	S. E.	3.34	3.48	3.57	2.36	1.89	1.82	2.83	4.68	5.59	6.10	6.26	4.93	3.37	1.74	1.31
Washington	S. E.	.....	.....	3.55	2.24	1.82	1.81	2.82	4.71	5.70	6.12	6.07	4.90	3.19	1.83	1.44

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* The names of observers, their places of observation, and the counties in which these places are situated, are stated in Exhibit 26, page 404.

† The full names of the divisions and the counties in each division are stated in Exhibit 1, page 257.

‡ This line is an average for only the stations for which statements are given for every month of the year.

§ The observations compiled in this line were made at Nirvana for 1878 and 1879 and for the first months of 1880, to and including April 25, 1880. After that date they were made with the same instruments at Reed City.

[a] The average for 12 stations in 1878 is 3.81 grains. [b] The average for 16 stations in 1879 is 3.43.
[c] For 11 months, 3.68. [d] For 87 observations. [e] For 86 observations. [f] For 69 observations.
[g] For 81 observations. [h] For 85 observations. [i] For 84 observations. [j] For 90 observations.
[k] For 79 observations. [l] For 89 observations..

NOTE.—The number of grains of vapor in a cubic foot of air at each observation was determined from readings of the psychrometer by means of Glaisher's table, Table XII. of the Smithsonian Meteorological and Physical Tables (1859.)

The lines for 13 stations in Table IV. are graphically represented in Diagrams IV. and V., pages 429 and 430.

TABLE V.—*Average Per Cent of Saturation of the Atmosphere with Vapor of Water (Relative Humidity) during the Year, and during each Month of the Year 1880, at 15 Stations in Michigan,—Average of Observations made Daily at 7 A. M., 2 P. M. and 9 P. M., by Observers* for the State Board of Health, and for the U. S. Signal Service.*

STATIONS IN MICHIGAN.*	Divisions of the State. †	PER CENT OF SATURATION,—RELATIVE HUMIDITY.														
		YEAR.			MONTHS, 1880.											
		1878.	1879.	1880.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 14 Stations‡	------	[a]	[b]	73	79	75	70	67	65	70	74	75	74	75	77	81
Escanaba*	U. P.	----	----	70	66	63	63	64	63	72	73	73	70	77	78	82
Marquette	U. P.	----	68	68	74	69	63	65	60	68	67	71	65	72	69	73
Alpena	N. E.	----	72	75	80	77	76	68	66	72	75	71	76	73	80	80
Grand Haven	W.	----	72	76	79	78	73	73	70	73	77	78	74	73	77	83
Nirvana and Reed City§	W.	74	70	66	76	72	60	[d] 61	59	66	69	69	72	69	56	57
Port Huron	B. & E.	----	72	73	79	74	70	64	65	69	73	76	73	75	79	80
Thornville	B. & E.	81	79	80	89	87	81	74	70	[e] 74	75	79	78	80	86	92
Lansing, S. B. of H.	C.	----	70	68	75	58	63	59	60	67	69	72	69	69	72	78
Otisville	C.	81	78	80	87	[f] 87	[e] 75	73	61	72	81	[d] 77	[g] 79	[e] 78	[h] 91	[i] 96
Battle Creek	S. C.	69	70	[c]	74	[g] 73	[j] 68	[k] 78	----	64	67	[j] 71	71	73	[e] 75	71
Kalamazoo	S. C.	75	72	72	79	71	66	65	66	60	73	67	74	74	79	86
Mendon	S. C.	78	78	76	[i] 82	76	73	68	[j] 70	[l] 73	75	77	[d] 75	76	82	88
Tecumseh	S. C.	80	75	75	86	75	74	73	68	75	76	77	77	80	72	70
Detroit	S. E.	71	70	72	80	75	70	66	63	68	71	77	73	74	72	76
Washington	S. E.	----	----	78	86	81	76	70	66	73	75	79	79	77	86	90

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* The names of observers, their places of observation, and the counties in which these places are situated, are stated in Exhibit 26, page 404.

† The full names of the divisions and the counties in each division, are stated in Exhibit 1, page 257.

‡ This line is an average for only the stations for which statements are given for every month of the year.

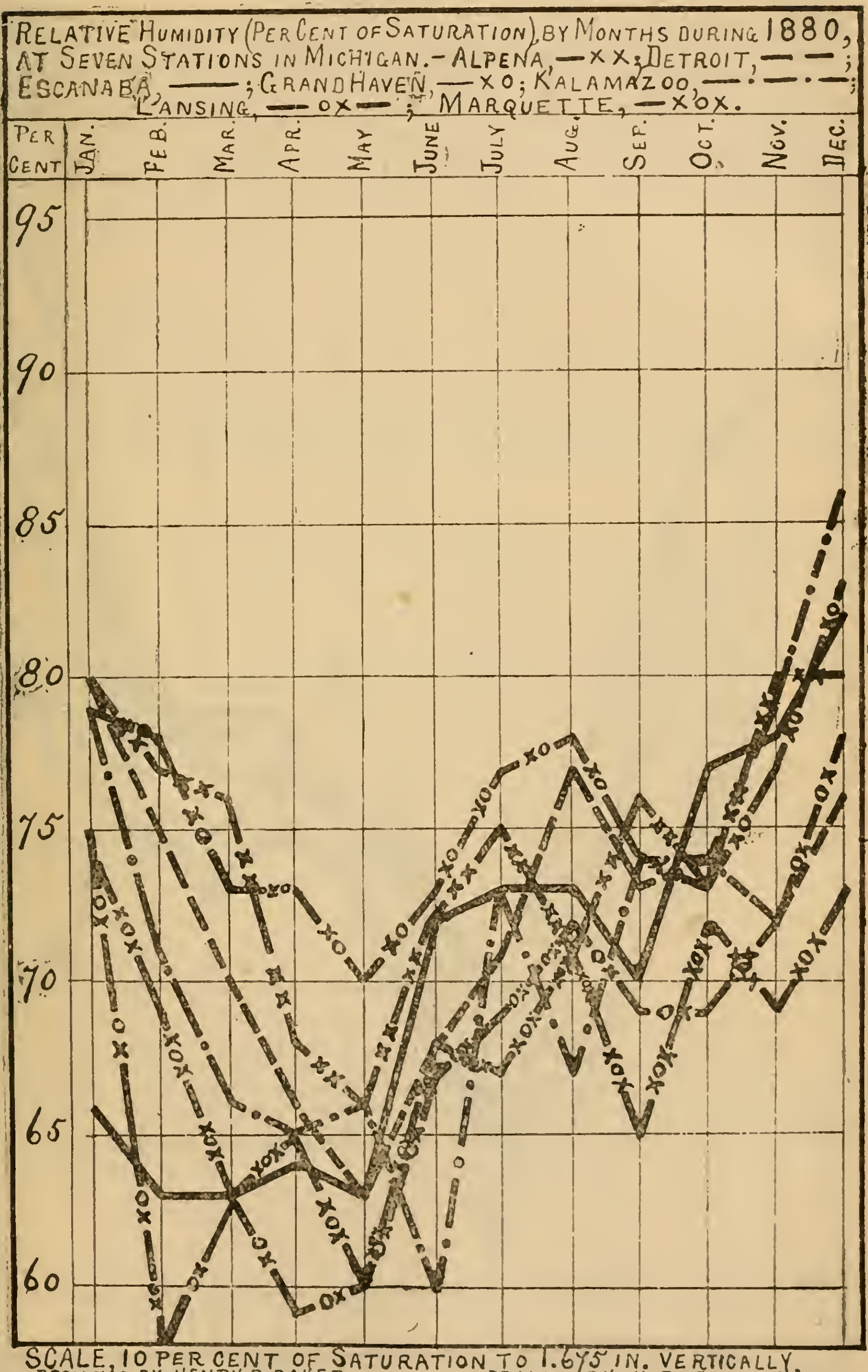
§ The observations compiled in this line were made at Nirvana for 1878 and 1879, and for the first months of 1880, to and including April 25, 1880. After that date they were made, with the same instruments, at Reed City.

[a] The average for 12 stations in 1878 is 78. [b] The average for 16 stations in 1879 is 74. [c] For 11 months, 71. [d] For 87 observations. [e] For 86 observations. [f] For 69 observations. [g] For 81 observations. [h] For 85 observations. [i] For 84 observations. [j] For 90 observations. [k] For 79 observations. [l] For 89 observations.

NOTE.—The per cent of saturation of each observation, was determined from a table received from the Chief Signal Officer at Washington, substantially the same as Guyot's Relative Humidity Table, in the Smithsonian Meteorological and Physical Tables (1859).

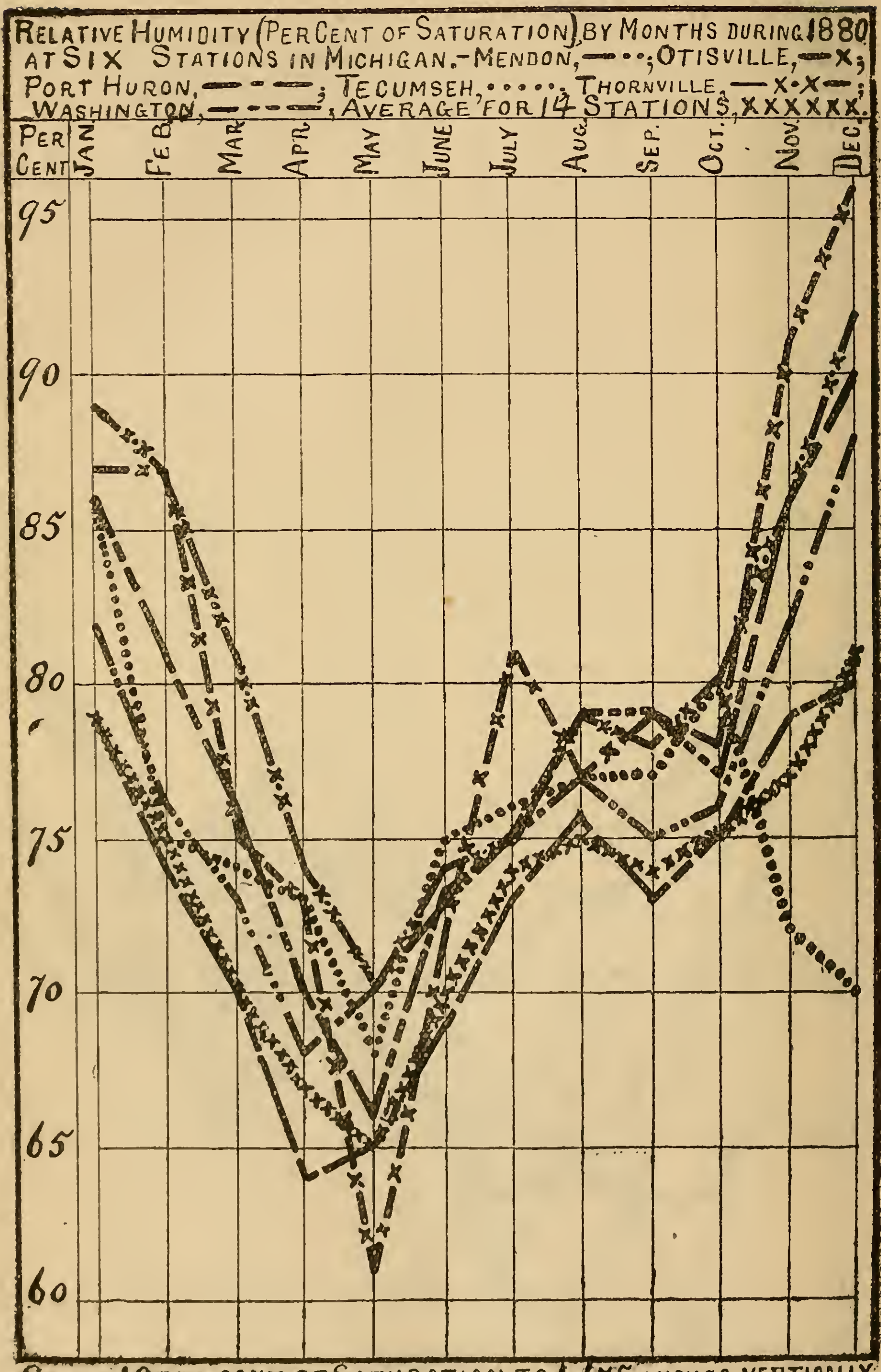
Graphic representations of 13 representative lines in this table are given in Diagrams VI. and VII., pages 433 and 434.

DIAGRAM VI.—RELATIVE HUMIDITY, BY MONTHS IN 1880.



SCALE, 10 PER CENT OF SATURATION TO 1.675 IN. VERTICALLY.
DESIGNED BY HENRY B. BAKER. DRAWN BY H. B. TURNER.

DIAGRAM VII.—RELATIVE HUMIDITY, BY MONTHS IN 1880.



SCALE, 10 PER CENT OF SATURATION TO 1.675 INCHES VERTICALLY.

DESIGNED BY HENRY B. BAKER. DRAWN BY H. B. TURNER.

EXHIBIT 36.—*Comparisons by Year and Months of the Average Relative Humidity (Per Cent of Saturation), at 14 Stations in 1880, with the Average at 16 Stations in 1879.**

YEARS, ETC.	PER CENT OF SATURATION,—Relative Humidity.												
	Annual Av.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 16 Stations in 1879	74	82	80	75	66	63	70	70	70	76	74	80	83
Av. for 14 Stations in 1880	73	79	75	70	67	65	70	74	75	74	75	77	81
In 1880 **Greater** than in 1879	------	------	------	------	1	2	------	4	5	------	1	------	------
In 1880 **Less** than in 1879	1	3	5	5	------	------	------	------	------	2	------	3	2

*Twelve of the stations, namely, Marquette, Alpena, Grand Haven, Nirvana, Port Huron, Thornville, Lansing, Otisville, Kalamazoo, Mendon, Tecumseh, and Detroit, were the same for both years; four, Petoskey, Niles, Battle Creek, and Woodmere Cemetery (near Detroit), were included in the average for 1879, but not in that for 1880; and two, Escanaba and Washington, were included in the average for 1880, but not in that for 1879.

CLOUDINESS.

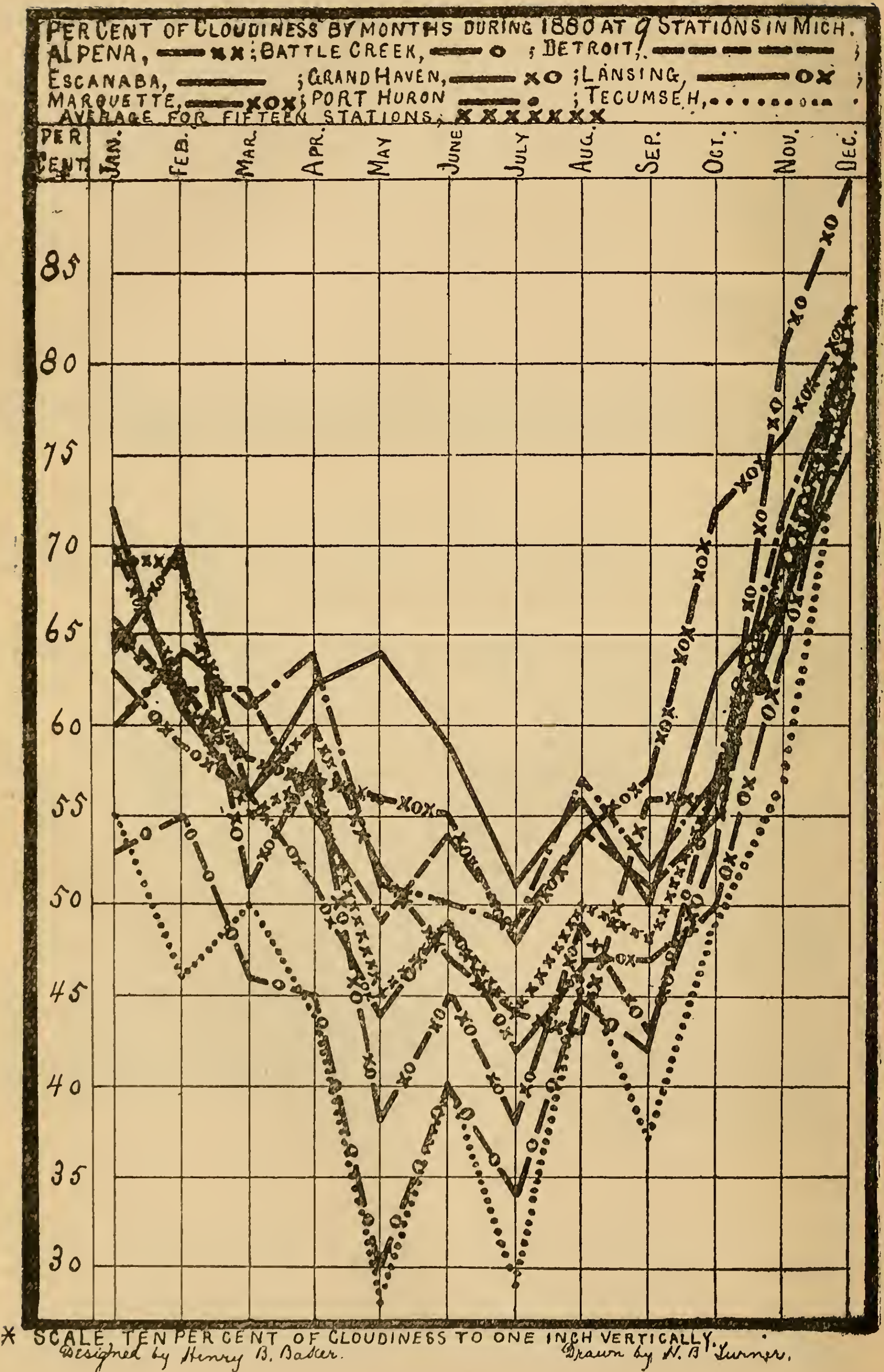
A comparison of Diagram VIII. representing cloudiness, with Diagrams VI. and VII. representing relative humidity, will serve to indicate what relation there seems to be between these two subjects in the year 1880.

EXHIBIT 37.—*Comparison by Year and Months of the Average Per Cent of Cloudiness at 21 Stations in 1880, with the Average at 19 Stations in 1879.**

YEARS, ETC.	AVERAGE PER CENT OF CLOUDINESS.												
	Annual Av.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 19 Stations in 1879	53	68	66	61	43	41	41	34	39	47	48	68	82
Av. for 21 Stations in 1880	57	64	61	55	57	45	50	45	50	48	57	68	83
In 1880 **Greater** than in 1879	4	------	------	------	14	4	9	11	11	1	9	------	1
In 1880 **Less** than in 1879	--------	4	5	6	------	------	------	------	------	------	------	------	------

* Fifteen of the Stations, namely, Marquette, Alpena, Grand Haven, Nirvana, Port Huron, Thornville, Lansing, Otisville, Niles, Battle Creek, Kalamazoo, Mendon, Tecumseh, Detroit, and Washington were the same for both years. Four, Petoskey, Coldwater, Ypsilanti, and Woodmere Cemetery (near Detroit), were included in the average for 1879, but not in that for 1880; and six, Escanaba, Ionia, Benton Harbor, Adrian, Ann Arbor, and Hillsdale, were included in the average for 1880, but not in that for 1879.

DIAGRAM VIII.—CLOUDINESS BY MONTHS IN 1880.



* SCALE, TEN PER CENT OF CLOUDINESS TO ONE INCH VERTICALLY.

Designed by Henry B. Baker. Drawn by H. B. Turner.

TABLE VI.—*Average Per Cent of Cloudiness, for the Year and for each Month of the Year 1880, at 23 Stations in Michigan,—Average of Observations made Daily at 7. A. M., 2 P. M., and 9 P. M., by Observers for the State Board of Health*, and for the U. S. Signal Service.*

STATIONS IN MICHIGAN.*	Division of the State.†	AVERAGE PER CENT OF CLOUDINESS.														
		YEAR.			MONTHS, 1880.											
		1878.	1879.	1880.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 21 Stations........‡	------	[a]	[b]	57	64	61	55	57	45	50	45	50	48	57	68	83
Av. for 15 Stations........§	------	[a]	[b]	57	65	62	55	57	45	49	44	50	48	57	69	83
Escanaba ....§	U. P.†	----	----	61	72	61	56	62	64	59	51	56	50	63	67	75
Marquette................§	U. P.	----	57	62	70	62	58	57	56	55	48	54	57	72	76	83
Alpena ....§	N. E.	----	53	58	69	69	56	60	52	47	44	43	56	56	67	81
Grand Haven..............§	W.	----	54	57	64	70	51	58	38	45	38	49	43	53	81	90
Nirvana and Reed City§, ‖	W.	59	59	63	72	76	58	60	42	52	51	[e] 61	56	62	76	86
Port Huron...............§	B. & E.	----	58	60	60	64	61	64	51	50	49	57	52	57	72	81
Thornville................§	B. & E.	55	52	55	64	63	53	57	41	44	46	48	41	53	62	84
Ionia	C.	----	----	61	67	57	57	70	48	53	56	52	47	58	75	88
Lansing....................§	C.	----	54	54	63	59	56	51	44	49	42	47	47	50	64	80
Otisville	C.	60	51	54	64	59	[f] 48	54	40	43	46	[g] 48	[h] 45	[i] 52	[l] 65	[g] 84
Benton Harbor.............	S. W.	59	----	50	[g] 54	59	51	47	38	40	33	[l] 35	[m] 40	[l] 52	[k] 66	[n] 86
Niles	S. W.	48	46	49	57	55	46	50	32	41	35	40	36	52	55	85
Adrian	S. C.	----	----	64	[g] 71	[k] 62	64	65	56	[l] 63	[o] 46	[g] 65	58	[e] 63	70	84
Ann Arbor...................	S. C.	----	----	60	62	62	60	58	50	61	49	55	50	58	68	83
Battle Creek...............§	S. C.	51	50	49	53	55	46	45	30	40	34	45	42	56	66	78
Coldwater	S. C.	45	50	[c]	60	49	43	----	40	44	35	38	36	50	46	76
Hillsdale.....................	S. C.	----	----	59	57	60	56	55	44	60	54	58	51	63	61	84
Hudson	S. C.	----	----	[d]	69	57	56	52	41	53	----	48	42	53	61	78
Kalamazoo.................§	S. C.	67	68	69	83	71	61	69	57	62	55	56	59	67	85	97
Mendon.....................§	S. C.	52	50	54	[e] 58	56	52	50	41	[h] 51	43	46	49	57	65	84
Tecumseh..................§	S. C.	50	44	47	55	46	50	44	28	40	29	46	37	49	57	80
Detroit.........................	S. E.	----	57	59	66	62	62	55	49	51	49	54	51	55	70	81
Washington.................	S. E.	----	52	54	68	60	55	67	40	40	40	44	41	49	66	78

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* The names of observers, their places of observation, and the counties in which these places are situated, are stated in Exhibit 26, page 404.

† The full names of divisions and the counties in each division are stated in Exhibit 1, page 257.

‡ This line is an average for only the stations from which statements were received for every month of the year.

§ The average for 15 stations, represented in Diagram VIII., page 436, and the stations included in that average, are designated by this section mark.

‖ The observations compiled in this line were made at Nirvana for 1878 and 1879, and for the first months of 1880, to and including April 25, 1880. After that date they were made at Reed City, about 10 miles distant from Nirvana.

[a] The average for 13 stations in 1878 is 54 per cent. [b] The average for 23 stations in 1879 is 53 per cent. [c] For 11 months, 47. [d] For 11 months, 55. [e] For 90 observations. [f] For 89 observations. [g] For 88 observations. [h] For 82 observations. [i] For 86 observations. [k] For 83 observations. [l] For 79 observations. [m] For 87 observations. [n] For 85 observations. [o] For 78 observations.

Graphic representations of 9 lines in this table are given in Diagram VIII., opposite this page.

FOGS.

During the year 1880, according to the reports, fog was observed 109 times in the morning, 16 times at 2 P. M., 25 times at night, the observations being at 7 A. M., 2 P. M., and 9 P. M. Fog was reported 21 times as occurring at some time during the day, no special time being mentioned, and 4 times as remaining all day.

The most wide-spread fog of the year occurred on January 6, and was observed at 11 of the 24 stations.

In Exhibit 38, the statements in which are graphically represented in Diagram IX., opposite page, the several months in 1880 may be compared with each other with respect to the total number of different days on which fog was observed at one station or more. The diagram may also be compared with those on temperature, relative humidity, cloudiness, etc., and by a comparison of the diagrams it may be seen that fog appears to have a somewhat close relation, inversely, to the wind.

EXHIBIT 38.—*Number of Different Days on which Fog was Observed at One or More of 20 Stations in Michigan, in 1880, and in each Month of the Year 1880.**

Year, 1880.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
76	11	3	4	5	2	6	8	9	12	10	4	3

* This exhibit contains statements only for those localities from which reports were received for every month of the year, as follows: Escanaba, Marquette, Alpena, Grand Haven, Nirvana and Reed City, Port Huron, Thornville, Ionia, Lansing, Otisville, Benton Harbor, Niles, Adrian, Ann Arbor, Hillsdale, Kalamazoo, Mendon, Tecumseh, Detroit, and Washington.

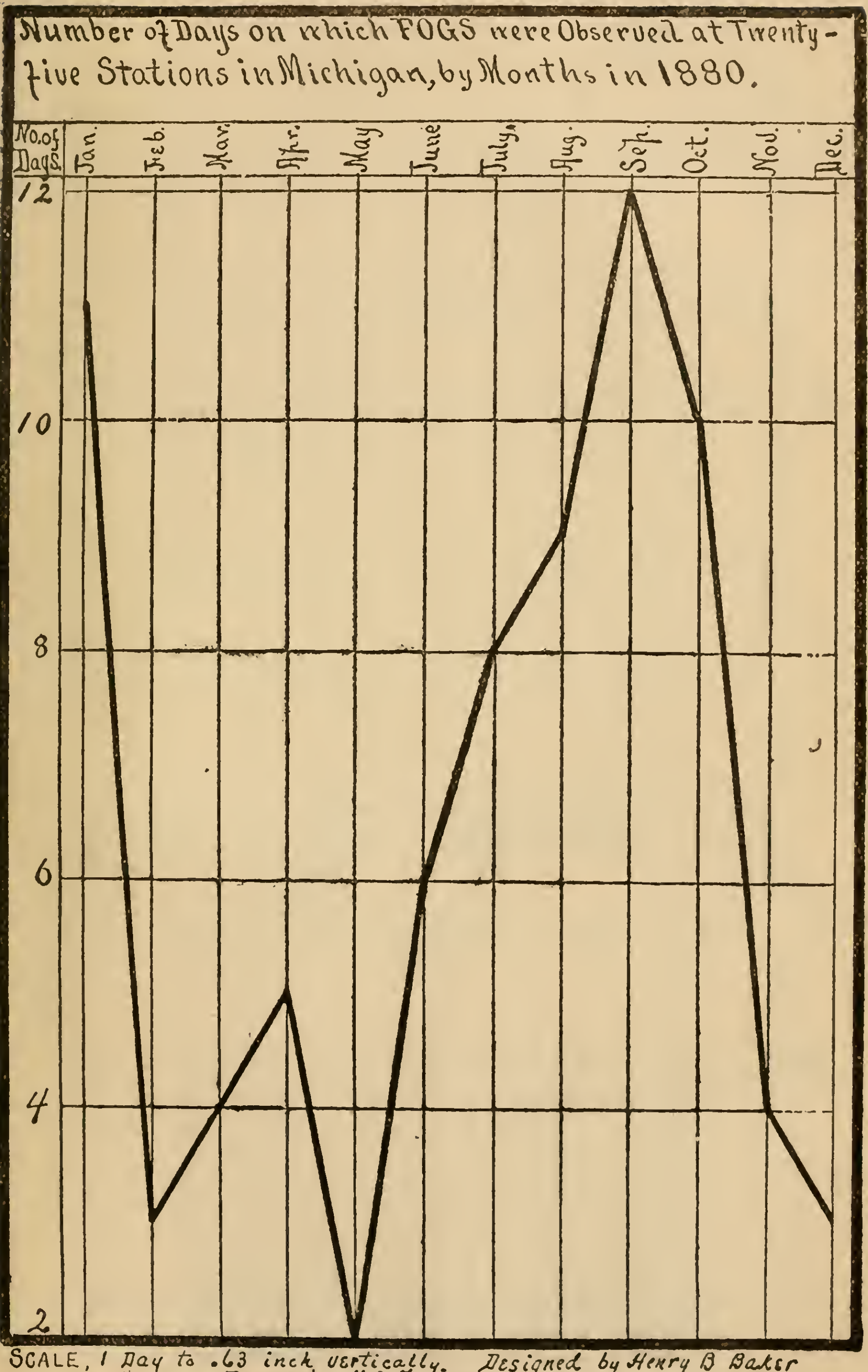
A graphic representation of the total number of different days in each month on which fog was observed, as shown in Exhibit 38, is given in Diagram IX., opposite this page.

EXHIBIT 39.—*Number of Observations at which Fog was Observed in Michigan in 1880, and in each month of the Year 1880. (Observations taken 3 times daily at 20 Stations.)**

YEAR 1880.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
165	59	3	4	8	2	8	11	20	18	21	5	6

* This Exhibit contains statements only for those localities from which registers were received for every month of the year, as follows: Escanaba, Marquette, Alpena, Grand Haven, Nirvana and Reed City, Port Huron, Thornville, Ionia, Lansing, Otisville, Benton Harbor, Niles, Adrian, Ann Arbor, Hillsdale, Kalamazoo, Mendon, Tecumseh, Detroit, and Washington.

DIAGRAM IX., ON FOGS IN 1880.



Number of Days on which FOGS were Observed at Twenty-five Stations in Michigan, by Months in 1880.

SCALE, 1 Day to .63 inch vertically. Designed by Henry B Baker
Drawn by H B Turner.

EXHIBIT 40.—*Number of different Days on which Fog was Recorded in 1880; and in each Month the Dates and Hours of Observation when Fogs were Recorded, at 24 Stations in Michigan.*

STATIONS IN MICHIGAN.*	No. of Days in 1880.	JANUARY.		FEBRUARY.		MARCH.		APRIL.	
		Day of Month.	Hour of Observation.	Day of Month.	Hour of Observation.	Day of Month.	Hour of Observation.	Day of Month.	Hour of Observation.
Escanaba	19	3	2 P. M. & 9 P. M.	25	7 A. M.	3	9 P. M.	3	2 P. M. & 9 P. M.
		8 and 9	7 A. M.					4, 26, 29	7 A. M.
		25	2 P. M.						
Marquette	10								
Minong	1							2	
Alpena	4								
Grand Haven	2			23	2 P. M.			4	7 A. M.
Nirvana and Reed City	7	6	7 A. M.					26	7 A. M.
		17	9 P. M.						
Port Huron	11	6, 8, 18	7 A. M.						
		7	2 P. M.						
Thornville	3	3, 5	7 A. M.						
Hastings	4	4	7 A. M.						
		7	9 P. M.						
Ionia	2								
Lansing	12	4	Evening.						
		6, 9	Morning.						
		7, 8	During day.						
		18	9 P. M.						
Otisville	7	6, 8	7 A. M.			22	7 A. M.		
Winfield	2								
Benton Harbor	5	2, 4, 6							
Niles	2	6							
Adrian	1								
Ann Arbor	15	3	2 P. M.						
		5, 6, 9	7 A. M.						
		7	7 A. M. & 2 P. M.						
		8	7 A. M., 2 P. M., and 9 P. M.						
Hillsdale	7	3, 6, 7, 8							
Hudson	1								
Kalamazoo	1								
Mendon	5	4	9 P. M.						
		6	7 A. M.						
Tecumseh	5	3, 6, 7, 8						26	
Ypsilanti	3								
Detroit	19	2	9 P. M.	27	7 A. M.	4, 27	7 A. M.		
		3	2 P. M.						
		6	7 A. M.						
		7, 8	7 A. M., 2 P. M., 9 P. M.						
Washington	16	3, 6, 7, 8	All day.						
		17	Morning.						

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* The names of observers are given in Exhibit 26, page 404.

EXHIBIT 40.—CONTINUED.—*Dates when Fogs were Recorded in 1880.*

STATIONS IN MICHIGAN.*	MAY.		JUNE.		JULY.		AUGUST.	
	Day of Month.	Hour of Observation.	Day of Month.	Hour of Observation.	Day of Month.	Hour of Observation.	Day of Month.	Hour of Observation.
Escanaba	9	7 A. M.	10	2 P. M.	12	7 A. M.	1	7 A. M.
	----	----	12	7 A. M.	----	----	----	----
Marquette	----	----	5, 10, and 12	9 P. M.	12 and 25	9 P. M.	----	----
	----	----	6	7 A. M.	13 and 14	7 A. M.	28 and 29	7 A. M.
Minong	----	----	----	----	----	----	----	----
Alpena	----	----	12	7 A. M.	----	----	31	2 P. M.
Grand Haven	----	----	----	----	----	----	----	----
Nirvana and Reed City	----	----	1	7 A. M.	----	----	----	----
Port Huron	----	----	----	----	----	----	18	7 A. M.
Thornville	----	----	----	----	15	7 A. M.	----	----
Hastings	----	----	----	----	----	----	30, 31	7 A. M.
Ionia	----	----	----	----	----	----	----	----
Lansing	----	----	----	----	----	----	20	7 A. M.
	----	----	----	----	----	----	31	Morn.
Otisville	----	----	----	----	10	2 P. M.	----	----
	----	----	----	----	15, 27	7 A. M.	----	----
Winfield	----	----	----	----	15	Morn.	31	7 A. M.
Benton Harbor	----	----	----	----	14	----	11	----
Niles	----	----	----	----	----	----	----	----
Adrian	----	----	----	----	----	----	18	7 A. M.
Ann Arbor	----	----	----	----	----	----	18, 20, 27, 29, 31	7 A. M.
Hillsdale	----	----	----	----	----	----	30, 31	7 A. M.
Hudson	----	----	26	Morn.	----	----	----	----
Kalamazoo	21	Morn.	----	----	----	----	----	----
Mendon	----	----	----	----	----	----	----	----
Tecumseh	----	----	----	----	----	----	----	----
Ypsilanti	----	----	----	----	----	----	27	Morn.
Detroit	----	----	----	----	29	7 A. M.	18, 20	7 A. M.
Washington	----	----	----	----	----	----	18, 27	7 A. M.

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* The names of observers are given in Exhibit 26, page 404.

EXHIBIT 40.—CONTINUED.—*Dates when Fogs were Recorded in 1880.*

STATIONS IN MICHIGAN.*	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.	
	Day of Month.	Hour of Observation.	Day of Month.	Hour of Observation.	Day of Month.	Hour of Observation.	Day of Month.	Hour of Observation.
Escanaba	2	7 A. M.	2	7 A. M.	4 7	2 P. M. 2 P.M. & 9 P.M.		
Marquette								
Minong								
Alpena	16, 17	7 A. M.						
Grand Haven								
Nirvana and Reed City	16 17	9 P. M. 7 A. M.	2	7 A. M.				
Port Huron	17	7 A. M.	15, 30	7 A. M.	26	9 P. M.	4, 5	7 A. M.
Thornville								
Hastings								
Ionia	16, 23	Morn.						
Lansing	21 22	Night. Morn.	13 29 30	7 A. M. 9: 15 A. M. 7 A. M.				
Otisville								
Winfield								
Benton Harbor								
Niles			29					
Adrian								
Ann Arbor	9	9 P. M.	15, 30	7 A. M.			4	9 P. M.
Hillsdale			30	7 A. M.				
Hudson								
Kalamazoo								
Mendon	14	7 A. M.	8, 29	7 A. M.				
Tecumseh								
Ypsilanti			3, 15	Day.				
Detroit	11, 15, 22, 23, 28 24	7 A. M. 7 A. M.	13, 30 9, 10, 30	7 A. M. 7 A. M.	28	7 A. M.	5 5, 25	7 A. M. 7 A. M.
Washington			14 15	9 P. M. 7 A.M. & 9 P.M.				

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* The names of observers are given in Exhibit 26, page 404.

RAINFALL.

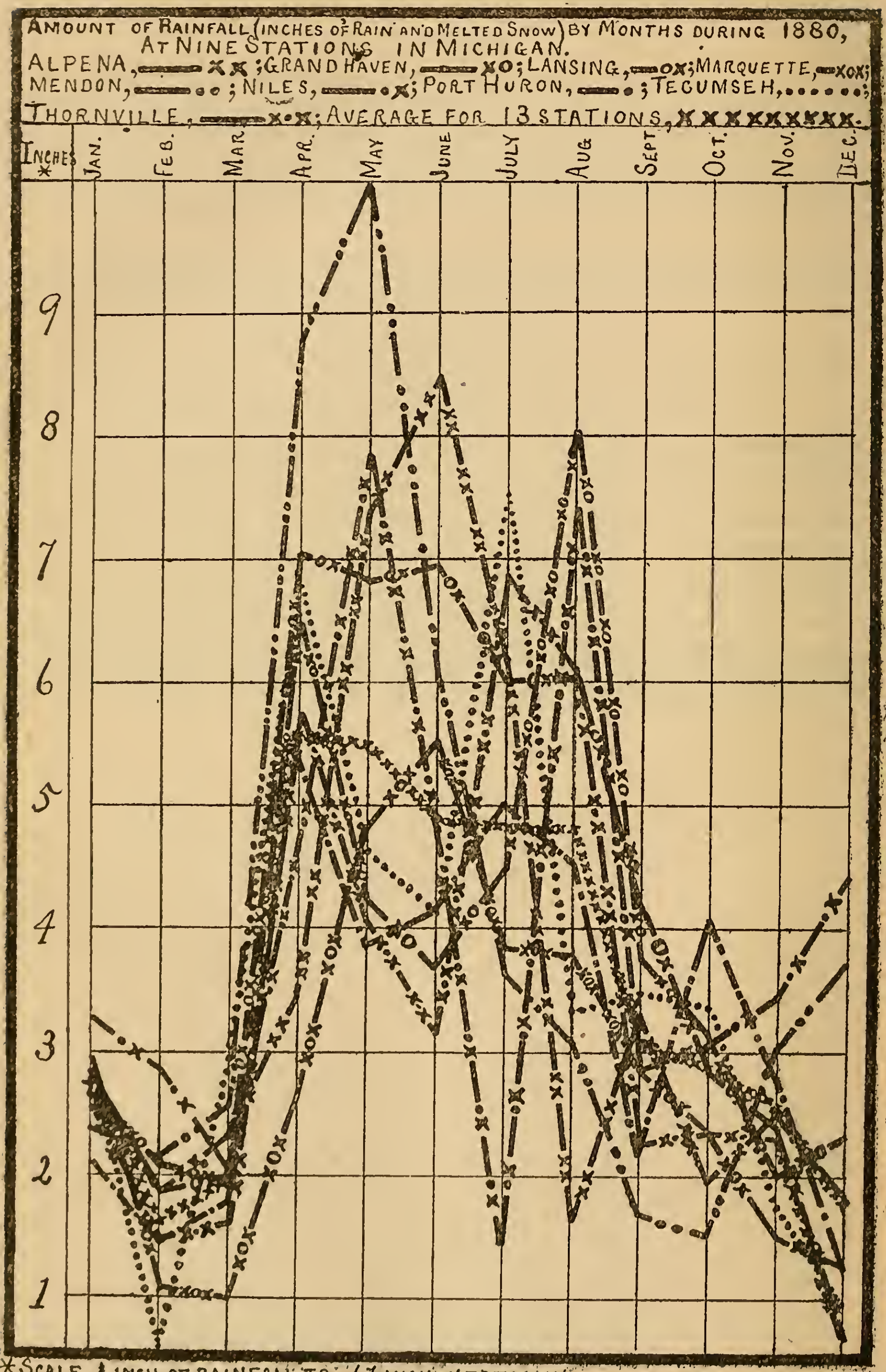
In the comparison of the rainfall by months in 1880 with that in 1879, as is done in Exhibit 41, it is proper to remember that the year 1879 was an exceptional year, the rainfall at the Agricultural College, near Lansing, being 3.62 inches less than the average for the preceding fifteen years. On page 339 of the Report of this Board for 1880 is an exhibit comparing the rainfall in each month of the year 1879 with that of the average for fifteen years, 1864–78.

EXHIBIT 41.—*Comparison by Year and Months of the Average Rainfall (Inches of Rain and Melted Snow) at 14 Stations in 1880, with the Average at 12 Stations in 1879.**

YEARS, ETC.	INCHES OF RAIN AND MELTED SNOW.												
	Annual Av.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 12 Stations in 1879	36.38	1.16	2.26	1.94	1.74	2.28	3.31	3.76	2.17	5.97	2.31	5.37	4.11
Av. for 14 Stations in 1880	41.88	2.71	1.56	1.87	5.53	5.44	4.84	5.03	4.86	2.98	2.84	2.53	1.70
In 1880 **Greater** than in 1879	5.50	1.55	------	------	3.79	3.16	1.53	1.27	2.69	------	.53	------	------
In 1880 **Less** than in 1879	------	------	.70	.07	------	------	------	------	------	2.99	------	2.84	2.41

*Nine of the Stations, namely, Marquette, Alpena, Grand Haven, Port Huron, Thornville, Otisville, Niles, Kalamazoo and Detroit were the same for both years; Three,—Nirvana, Coldwater, and Woodmere Cemetery (near Detroit), were included in the average for 1879, but not in that of 1880; and five,—Escanaba, Lansing, Mendon, Tecumseh, and Washington, were included in the average for 1880, but not in that for 1879.

DIAGRAM X.—RAINFALL BY MONTHS IN 1880.



*SCALE, 1 INCH OF RAINFALL TO .67 INCH VERTCALLY.

Drawn by H. B. Turner.

Designed by Henry B. Baker.

TABLE VII.—*Inches of Rain and Melted Snow, for the Year and for each Month of the Year 1880, at 16 Stations in Michigan,—as compiled from Daily Observations made by Observers* for the State Board of Health, and for the U. S. Signal Service.*

STATIONS IN MICHIGAN.	Divisions of the State.†	INCHES OF RAIN AND MELTED SNOW.														
		YEAR.			MONTHS, 1880.											
		1878.	1879.	1880.	Jan.	Feb.	Mar.	Apr.	May.	J'ne.	J'ly.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 14 Stations........‡	......	a	b	41.88	2.71	1.56	1.87	5.53	5.44	4.84	5.03	4.86	2.98	2.84	2.53	1.70
Av. for 13 Stations ....§	......	a	b	42.12	2.73	1.61	1.97	5.59	5.50	4.87	4.83	4.80	3.05	2.86	2.54	1.78
Escanaba.......*	U. P.†	.....	.....	30.35	3.42	1.01	1.95	1.86	2.29	4.83	3.00	3.38	2.85	1.14	2.39	2.23
Marquette......	U. P.	.....	40.48	33.50	2.94	1.07	1.00	2.62	4.83	5.52	3.82	3.77	2.82	2.35	1.49	1.27
Alpena..........	N. E.	.....	39.94	43.64	2.84	1.85	2.31	3.44	7.36	8.49	6.14	1.61	3.31	1.95	2.49	1.85
Grand Haven...	W.	.....	35.35	44.66	2.64	2.06	1.92	6.48	4.19	3.65	4.47	8.03	3.74	3.15	2.01	2.32
Nirvana and Reed City..‖	W.	39.18	34.95	40.77	4.11	3.90	2.89	3.42	4.33	2.98	4.95	3.75	2.18	2.56	2.07	3.63
Port Huron.....	B.& E.	.....	27.23	38.47	2.12	1.45	1.75	5.39	3.84	4.14	5.01	4.52	2.17	4.06	2.79	1.23
Thornville......	B.& E.	35.24	31.50	39.00	2.55	1.46	1.58	5.74	4.05	3.12	6.86	6.08	2.24	2.36	2.29	.67
Lansing..........	C.	.....	.....	49.38	2.67	1.85	2.00	7.06	6.81	6.96	6.00	6.02	4.13	2.84	2.38	.66
Otisville........	C.	37.63	29.52	38.68	2.43	.87	.57	4.75	4.72	4.43	7.51	5.61	2.07	2.59	2.48	.65
Niles............	S. W.	38.06	45.84	47.95	3.27	2.85	2.01	4.69	7.87	4.74	1.42	7.35	2.86	3.04	3.45	4.40
Battle Creek...	S. C.	25.40	.....	c	1.75	.40	0.05	.13	.12	.....	.55	2.75	2.60	1.90	1.70	.....
Kalamazoo......	S. C.	45.82	37.53	42.22	3.01	2.06	1.16	8.00	5.95	3.99	3.93	3.38	3.61	2.49	2.99	1.65
Mendon..........	S. C.	36.87	.....	48.45	2.38	2.12	2.55	8.77	10.02	6.00	3.62	3.05	1.68	1.51	3.04	3.71
Tecumseh	S. C.	39.89	.....	42.20	2.86	.57	2.93	6.79	4.60	4.11	7.53	3.31	3.48	3.34	1.71	.97
Detroit..........	S. E.	43.39	37.17	47.95	2.81	1.49	2.74	6.15	4.86	4.48	5.71	5.53	4.30	5.45	3.20	1.23
Washington.....	S. E.	.....	.....	39.83	2.00	1.13	1.70	5.64	4.79	3.30	5.33	6.33	2.41	3.54	2.75	.91

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* The names of observers, their places of observation, and the counties in which these places are situated, are given in Exhibit 26, page 404.

† The names of the divisions, and the counties in each, are stated in Exhibit 1, page 257.

‡ This line is an average for only the 14 stations from which statements were received for every month of the year. It does not include the line for Nirvana and Reed City.

§ The average for 13 stations is the average line represented in Diagram X., opposite page. It includes all the stations for which statements are given for every month of 1880 except Otisville and Nirvana and Reed City.

‖ The observations compiled in this line were taken at Nirvana for 1878 and 1879, and for the first months of 1880, to and including April 25, 1880. After that date they were made, with the same instruments, at Reed City, about 10 miles distant from Nirvana.

a The average for 12 stations in 1878 is 37.99 in. b The average for 12 stations in 1879 was 36.38 in. c For 10 months 11.95.

Comments on the rainfall in 1880 are printed on page 443.

The lines for 9 representative stations in Table VII. are graphically represented in Diagram X, opposite this page.

OZONE.

In view of the great interest which is being taken in ozone as a promoter of health and as a cause of sickness, it is a pleasure to refer to the long-continued series of records of valuable observations of the quantity of ozone in the atmosphere, which are to be found in the Reports of this Board, the earliest observations and longest series being by Prof. R. C. Kedzie, of the Agricultural College, near Lansing, Michigan. So far as known, these results are the most carefully tabulated, cover the longest time, and being accompanied by records of sickness, are the most valuable for study in the relations which this agent has in the causation of disease.

As there have been several requests (which, in some cases, could not be complied with) for the paper used by the observers for this Board in taking observations, it is thought best to publish the formula for preparing the paper. It here follows:

FORMULA FOR PREPARING SCHÖNBEIN'S TEST PAPER FOR OZONE.

Iodide of potassium (free from iodate of potassa*)......	1	part.
Starch..	10	"
Water	200	"

Dissolve the iodide of potassium in water, add starch, and heat to boiling. After it cools, spread evenly on unsized paper; dry the paper, and *keep from the air and light.*

The paper used is unsized "book-paper" manufactured by the Peninsular Paper Co., of Ypsilanti, Mich., is 27x40 inches in size, and weighs 57 pounds to the ream.

OZONE OBSERVATIONS AT A GREAT ALTITUDE, IN COLORADO.

BY JOHN BELL, M. D., OF BENTON HARBOR, MICH.

When in Colorado I tried the ozone paper, exposing it as we do here, but could obtain no result. Twice there was a slight trace of discoloration. Silver Cliff (where the observations were taken) is about 8,500 feet above sea level, between two ranges of mountains, some ten miles distant. The space between the mountains they call "Wet Mountain Valley," and is well settled, the inhabitants raising vegetables of nearly all descriptions, hay, oats, etc.

During my stay there, there were no clouds, perfectly clear sky night and day. Thermometer standing at midday from 50° to 60°; during the night, from 30° to 35°. It had not rained since the first week in September. Their prevailing sickness was diarrhœa and mountain fever, which I think is very much like our typho-malarial, at any rate their treatment of it is quite similar. There had been a good deal of sickness during the season, but a great cause lay in their mode of living (living as miners do), their water supply was very bad, and I presume their whisky was not much better. I neglected to try that. * * * Very respectfully,

DR. J. BELL.

Benton Harbor, Mich., Oct. 3, 1880.

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* To insure freedom from iodate of potassa, add finely divided carbon to the iodide, and then heat to redness.

EXHIBIT 42.—*Comparison of the Average Amount of Atmospheric Ozone, as Indicated by the Degree of Coloration* of Schönbein's Test-paper, during the Year and during each Month of the Year 1880, with the Average for the Eight Years 1872-9, and with the Average for 1879; also Statement of the Average for each of the Eight Years 1872-79,—Test-paper exposed from 7 A. M. to 2 P. M., for the Day Observation, and from 9 P. M. to 7. A. M. for the Night Observation,—Observations made by Prof. R. C. Kedzie, at the State Agricultural College,† near Lansing, Mich.*

Months.	Ozone,—Degrees of Coloration.*																							
	Day Observation,—7 a. m. to 2 p. m.*												Night Observation,—9 p. m. to 7 a. m.*											
	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.†	Av. for 8 Years, 1872-9.	1880.	In 1880 More (+), or Less (-), than Av. for 8 Yrs., 1872-9.	In 1880 More (+), or Less (-), than in 1879.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.†	Av. for 8 Years, 1872-9.	1880.	In 1880 More (+), or Less (-), than Av. for 8 Yrs., 1872-9.	In 1880 More (+), or Less (-), than in 1879.
Ann. Av.	2.82	4.02	4.10	4.53	3.68	3.66	3.50	3.24	3.69	4.04	+ .35	+ .80	4.24	4.72	3.99	5.04	4.11	3.33	3.42	3.36	4.01	3.63	- .38	+ .27
Jan.......	4.50	5.06	5.10	5.52	5.32	4.87	3.74	4.00	4.76	2.97	-1.79	-1.03	5.44	6.32	6.39	5.93	6.90	5.03	4.48	4.48	5.62	2.97	-2.65	-1.51
Feb.......	4.00	4.21	5.53	5.78	5.76	4.54	5.00	4.54	4.92	3.83	-1.09	- .71	6.00	5.93	6.10	6.57	7.27	4.14	5.33	5.01	5.79	4.17	-1.62	- .84
March...	3.00	4.09	5.00	5.70	6.66	5.29	4.68	3.93	4.72	5 52	+ .80	+1.59	5.71	5.80	6.00	6.19	7.00	6.06	4.94	4.30	5.75	4.94	- .81	+ .64
April....	2.63	3.76	5.70	3.73	3.70	3.70	4.37	3.00	3.82	5.10	+1.28	+2.10	5.30	4.27	6.60	3.96	5.53	4.27	4.53	4.00	4.81	4 93	+ .12	+ .93
May.......	2.14	4.58	5.80	3.19	3.10	3.29	3.97	2.79	3.61	3.65	+ .04	+ .86	3.84	5.59	4.90	4.03	4.13	2.94	4.10	2.68	3.90	3.03	- .87	+ .35
June	1.91	3.26	3.50	3.96	1.87	3.17	3.17	2.43	2.91	3.77	+ .86	+1.24	3.23	2.66	2.34	3.66	2.27	2.90	3.00	2.03	2.76	2.70	- .06	+ .67
July......	.88	3.59	1.80	3.52	2.16	2.71	2.10	2.90	2.46	3.61	+1.15	+ .71	2.28	3.06	1.50	3.22	1.58	1.77	1.74	2.13	2.16	2.23	+ .07	+ .10
Aug.......	.98	3.55	2.80	3.50	1.97	3.42	2.32	2.58	2.64	3.97	+1.33	+1.39	.99	2.65	1.10	3.70	1.26	1.03	1.52	1.76	1.75	2.23	+ .48	+ .47
Sept......	1.40	2.30	2.90	4.30	2.60	2.93	2.23	2.87	2.69	2.93	+ .24	+ .06	1.86	4.27	1.20	3.68	1.73	1.53	1.60	2.53	2.30	2.15	- .15	- .38
Oct........	1.93	4.52	3.32	5.30	3.45	3.20	2.71	3.32	3.47	2.90	- .57	- .42	3.18	4.69	3.01	6.20	3.48	3.19	1.97	2.81	3.57	2.68	- .89	- .13
Nov.....†	4.60	4.30	3.80	4.90	3.57	3.60	3.17	3 53	3.93	5.10	+1.17	+1.57	6.17	5.47	4.50	6.60	3.33	3.73	3.14	4.63	4.70	5.33	+ .63	+ .70
Dec.....†	5.81	4.97	4.00	5.00	4.57	3.17	4.55	2.97	4.38	5.16	+ .78	+2.19	6.84	5.89	4.20	6.70	4.81	3.37	4.74	3.87	5.05	6.23	+1.18	+2.36

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* According to a scale of 10 degrees of coloration of Schönbein's test-paper. Maximum of scale=10. The tinted scale is printed on page 142 of the Report of the State Board of Health for 1875.

† For November and December, 1879, the observations were made by Harry B. Turner, at the office of the State Board of Health, Lansing.

TABLE VIII. *Relative Amount of Ozone in the Atmosphere, by Day during the Year and during each Month of the Year 1880, at 24 Stations in Michigan,—as Indicated by Averages of Observations made Daily by Exposing Test-paper prepared according to Schönbein's formula, from 7 A. M. to 2 P. M.—Recorded according to a scale of 10 Degrees of Coloration of the Test-paper (greatest coloration by Ozone equals 10), by Observers for the State Board of Health and for the U. S. Signal Service.**

STATIONS IN MICHIGAN.*	Division of the State.†	DEGREES OF COLORATION OF TEST-PAPER.—DAY OBSERVATIONS.														
		YEAR.			MONTHS, 1880.											
		1878.	1879.	1880.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 17 Stations.‡	------	[a]	[b]	3.25	2.54	3.69	3.68	3.83	3.33	3.25	3.14	3.00	2.78	2.99	3.30	3.53
Av. for 16 Stations.§	------	-----	-----	3.20	2.51	3.68	3.57	3.75	3.31	3.22	3.11	2.94	2.77	2.99	3.20	3.43
Escanaba*	U. P.†	-----	-----	[c]	-----	-----	-----	-----	-----	-----	3.35	2.61	1.70	2.42	2.07	2.19
Marquette	U. P.	-----	-----	2.62	1.97	2.17	2.87	3.43	2.39	2.60	2.42	3.71	2.47	2.74	2.30	2.32
Alpena	N. E.	-----	3.08	2.60	3.26	3.66	2.90	3.63	2.06	2.30	2.67	2.77	2.10	2.39	1.70	1.81
Grand Haven	W.	-----	-----	4.04	2.97	4.14	4.39	4.23	3.97	4.33	4.00	[k]3.93	3.47	4.23	4.03	4.81
Nirvana and Reed City‖	W.	3.06	2.85	3.98	3.39	5.97	5.74	4.90	3.29	3.13	2.90	3.30	3.13	3.23	3.43	3.39
Port Huron	B. & E.	-----	-----	[d]	3.06	-----	-----	4.33	[l]4.40	3.70	3.10	3.45	3.60	3.03	2.90	3.71
Thornville	B. & E.	2.78	¶1.77	3.18	1.74	3.72	3.87	3.60	3.39	3.43	3.10	2.84	[i]2.37	3.16	3.13	3.81
Ag'l College	C.	3.50	3.24	4.04	2.97	3.83	5.52	5.10	[i]3.65	3.77	[i]3.61	3.97	2.93	2.90	5.10	5.16
Ionia	C.	-----	-----	3.78	3.90	3.76	3.87	3.93	8.77	4.17	4.35	4.03	4.30	3.19	2.90	3.16
Lansing	C.	-----	3.15	3.70	2.90	4.38	3.42	4.28	3.81	3.53	3.39	2.90	3.73	3.19	4.33	4.55
Otisville	C.	3.98	2.89	3.34	2.42	[h]4.31	[j]4.11	4.38	[i]3.33	3.12	2.37	[j]2.64	2.45	[k]2.83	3.43	[k]4.72
Benton Harbor	S. W.	-----	-----	[e]	[h]2.52	4.00	[k]4.14	[j]4.36	[q]4.08	[k]3.31	[j]3.29	[n]3.16	[h]2.74	[o]2.96	[h]3.67	-----
Niles	S. W.	4.50	3.22	3.36	2.68	3.53	3.58	4.10	3.84	3.60	3.29	3.13	2.77	[k]3.14	3.53	3.16
Adrian	S. C.	-----	-----	2.28	[l]1.10	3.17	3.32	3.47	2.87	2.23	[q]2.12	[l]2.10	1.60	1.71	1.93	[l]1.70
Ann Arbor	S. C.	-----	-----	1.67	[k]1.14	[q]2.04	[k]1.97	[k]2.34	[i]1.90	[j]1.43	1.97	1.35	[h]1.48	1.52	[j]1.00	[k]1.86
Battle Creek	S. C.	2.89	2.22	3.37	2.03	3.21	3.10	4.40	3.97	4.17	4.26	3.06	2.80	3.00	3.23	3.19
Coldwater	S. C.	3.01	-----	4.02	3.74	4.03	4.00	4.10	4.61	4.23	3.81	3.32	[h]3.30	[k]3.74	[q]4.81	[q]4.54
Hillsdale	S. C.	-----	-----	[f]	-----	[n]4.00	3.39	3.50	3.00	2.67	2.13	2.16	2.20	2.32	2.33	2.32
Hudson	S. C.	-----	-----	[g]	3.52	4.76	[p]2.71	2.77	2.65	2.67	-----	2.52	2.03	2.52	2.43	3.00
Kalamazoo	S. C.	2.67	2.49	2.63	1.77	3.45	2.71	2.67	2.55	2.50	2.26	[p]2.29	2.30	2.97	2.93	[i]3.20
Mendon	S. C.	3.08	2.67	3.36	[i]2.17	4.00	4.10	3.97	3.45	3.00	2.68	[l]2.83	2.60	2.90	4.47	4.13
Tecumseh	S. C.	4.24	3.10	3.38	2.94	4.59	4.39	3.13	2.90	3.00	3.19	2.74	2.77	3.16	3.60	4.19
Detroit	S. E.	-----	----	0	0	0	0	0	0	0	0	0	0	0	0	0
Washington	S. E.	-----	2.97	3.94	3.42	4.72	4.45	4.28	4.10	3.80	3.83	3.40	3.83	4.00	3.73	3.68

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* The names of observers, their places of observation, and the counties in which these places are situated, are stated in Exhibit 26, page 404.

† The full names of the divisions and the counties in each division are stated in Exhibit 1, page 257.

‡ An average for only the 17 stations for which statements are given for every month of the year, not including Detroit or Nirvana and Reed City.

§ The average for 16 stations is the average line represented in Diagram XI., page 449. It does not include the observations at the Agricultural College, at Detroit, at Nirvana and Reed City, or at any station from which reports were not received for every month of the year.

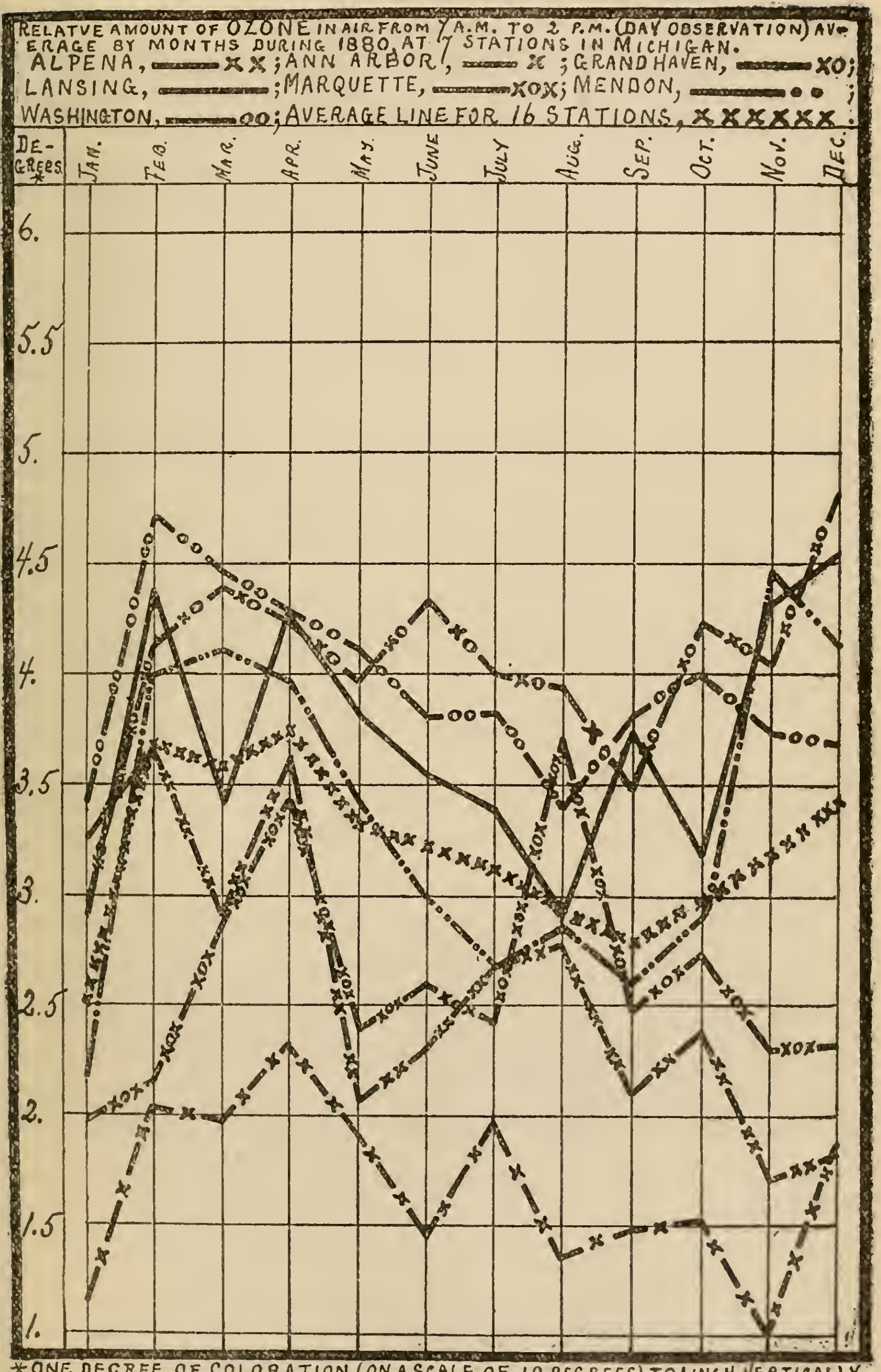
‖ The observations compiled in this line were made at Nirvana for 1878, 1879, and for the first months of 1880, to and including April 25, 1880. After that date they were made at Reed City.

¶ The average day ozone stated for the Agricultural College for 1879 includes observations made at the Office of the State Board of Health, Lansing, for November and December of that year. The Agricultural College is about three miles east from Lansing.

[a] The average for 12 stations in 1878 is 3.39. [b] For 13 stations in 1879, 2.85. [c] For 6 months, 2.39. [d] For 10 months 2.94. [e] For 11 months, 3.48. [f] For 11 months, 2.73. [g] For 11 months, 2.87. [h] For 27 days. [i] For 30 days. [j] For 28 days. [k] For 29 days. [l] For 21 days. [n] For 19 days. [o] For 24 days. [p] For 17 days. [q] For 26 days.

Graphic representations of 7 lines in this table are given in Diagram XI., opposite this page.

DIAGRAM XI.—OZONE, DAY, BY MONTHS IN 1880.



*ONE DEGREE OF COLORATION (ON A SCALE OF 10 DEGREES) TO 1 INCH VERTICALLY.

Drawn by H. B. Turner.

Designed by Henry B. Baker.

TABLE IX.—*Relative Amount of Ozone in the Atmosphere at Night, during the Year and during each Month of the Year 1880, at 24 Stations in Michigan,—as indicated by Averages of Observations made Nightly by exposing Test-paper, prepared according to Schonbein's formula, from 9 P. M. to 7 A. M.—Recorded, according to a scale of 10 Degrees of Coloration of the Test-paper (greatest coloration by Ozone equals 10), by Observers for the State Board of Health, and for the U. S. Signal Service.**

STATIONS IN MICHIGAN.	Divisions of the State.†	DEGREES OF COLORATION OF TEST-PAPER.—NIGHT OBSERVATIONS.														
		YEAR.			MONTHS, 1880.											
		1878.	1879.	1880.	Jan.	Feb.	Mar.	Apr.	May.	J'ne.	J'ly.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 17 Stations‡	------	[a]	[b]	3.13	3.84	4.75	4.69	4.37	3.89	3.35	2.77	2.40	1.88	3.13	3.75	4.11
Av. for 16 Stations§	------	-----	-----	3.10	2.84	3.90	3.70	3.96	3.33	2.83	2.60	2.44	2.19	2.75	3 21	3.49
Escanaba	U. P.	-----	-----	[c]	-----	-----	-----	-----	-----	-----	3.16	3.06	2.50	3.03	1.77	2.19
Marquette	U. P.	-----	-----	2.71	2.19	2.48	2.87	3.30	2.97	2.27	2.48	3.84	2.40	2.84	2.43	2.45
Alpena	N. E.	-----	3.02	1.69	2.16	2.79	2.10	2 70	1 71	1.33	1.13	1.35	1.08	1 32	1.23	1.39
Grand Haven	W.	-- --	-----	3.94	2.71	4.34	4.48	4.37	3.71	4.30	3.61	[h]3.68	3.40	4.48	4.10	4.13
Nirvana & Reed City‖	W.	2.57	2.51	3 71	3.94	6.64	6.55	5.17	3.13	2.47	2.00	1.97	2.23	2.45	3.97	4.03
Port Huron	B. & E.	-----	-----	[d]	3.97	-----	-----	4.63	3.26	3.60	3.71	3.35	3.30	2.90	3.17	3.81
Thornville	B. & E.	3.09	2.68	3.46	3.35	5.24	5.23	4.90	4.19	3.27	2.90	1.77	[l]2.00	2.68	2.70	3.29
Agrl. College	C.	3.42	¶3.36	3.63	2.97	4.17	4.94	4.93	3.03	2.70	2.23	2.23	2.15	2.68	[j]5.33	6.23
Ionia	C.	-----	-----	4.02	4.10	4.38	3.90	4.20	4.13	4.60	4.48	4.68	4.27	3.35	2 93	3.23
Lansing	C.	-----	3.58	4.14	3.16	4.97	3.81	4.93	4.32	3.87	3.61	2.87	3.60	3.71	5.60	5.26
Otisville	C.	4.40	3.13	3.71	3.03	[h]4.43	4.47	4.22	3.73	[j]3.03	[l]2.43	[h]2.41	[k]1.71	[l]3.83	[s]5.08	[j]6.10
Benton Harbor	S. W.	-----	-----	[e]	[l]3 82	[h]5.18	4.68	[j]5.21	[n]4.64	[h]2.82	[h]2.32	[o]2.19	[l]2.04	[h]3.14	[j]4.03	-----
Niles	S. W.	4.18	3.14	2.98	3.35	4.03	3.61	4.00	3.35	2.20	2.03	2.32	1.77	[j]2.55	3.37	3.16
Adrian	S. C.	-----	-----	2.06	[o]1.86	3.10	3.23	3.73	2.19	[l]1.37	[n]1.32	[h]1.21	1.10	1.42	1.83	[l]2.40
Ann Arbor	S. C.	-----	-----	1.74	[j]1.66	[h]2.04	[n]2.20	2.33	[h]2.28	[l]1.48	1.87	0.97	1.40	1.55	[j]1.00	[l]2.10
Battle Creek	S. C.	3.00	2.09	2.80	1.90	3.28	3.29	4.67	3.39	3.03	2.68	2.23	1.77	2.16	2.60	2.65
Coldwater	S. C.	3.61	-----	3.66	3.58	3.55	3.13	3.80	4.45	4.17	3.97	[l]3.37	[l]3.00	[k]3.31	[k]3.62	[l]3.93
Hillsdale	S. C.	-----	-----	[f]	-----	[p]4.42	3.74	3.37	3.00	2.43	2.13	1.94	1.73	1.68	2.27	2.32
Hudson	S. C.	-----	-----	[g]	4.90	6.14	[q]2.18	2.80	2.26	2.07	-----	1.74	1.30	2.71	3.03	3.65
Kalamazoo	S. C.	3.17	2.85	3 02	2.97	4.62	3.52	3.47	2.77	2.40	2.58	[r]2.67	2.20	2.87	3.03	[l]3.13
Mendon	S. C.	3.21	2.79	3.23	[l]2.33	4.52	[l]4.73	4.63	3.68	2.23	1.94	1.71	[j]1.93	2.52	4.73	3.81
Tecumseh	S. C.	3.95	3.08	2 91	3 23	3.83	3.87	3.80	2.48	2.43	1.84	1.58	1.53	2.26	3.37	4.65
Detroit	S. E.	-----	-----	0	0	0	0	0	0	0	0	0	0	0	0	0
Washington	S. E.	-----	3.07	3.58	3.84	4.75	4.69	4.37	3.89	3.35	2.77	2.40	1.88	3.13	3.75	4.11

* The names of observers, their places of observation, and the counties in which these places are situated, are stated in Exhibit 26, page 404.

† The full names of the divisions and the counties in each division, are stated in Exhibit 1, page 257.

‡ This line is an average for only the 17 stations for which statements are given for every month of the year, not including Detroit or Nirvana and Reed City.

§ The average for 16 stations is the average line represented in Diagram XII., page 451. It does not include the observations at the Agricultural College, at Detroit, at Nirvana and Reed City, or at any station from which reports were not received for every month of the year.

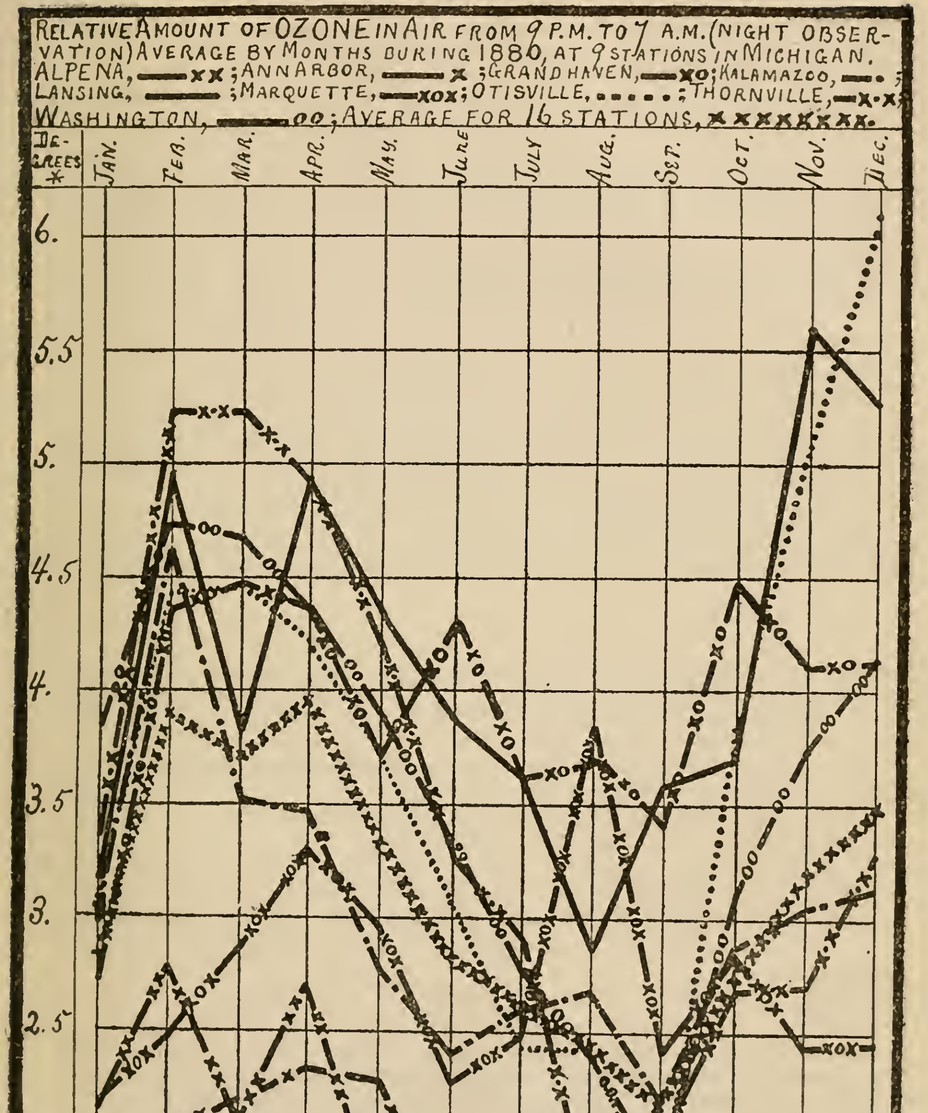
‖ The observations compiled in this line were made at Nirvana for 1878, 1879, and for the first months of 1880, to and including April 25, 1880. After that date they were made at Reed City.

¶ The average night ozone stated for Agricultural College for 1879 includes observations made at the office of the State Board of Health, Lansing, for November and December of that year. The Agricultural College is about three miles east from Lansing.

[a] The average for 12 stations in 1878 is 3.43. [b] The average for 13 stations in 1879 is 2.94. [c] For 6 months, 2.62. [d] For 10 months, 3.57. [e] For 11 months, 3.64. [f] For 11 months, 2.64. [g] For 11 months, 2.98. [h] For 28 days. [i] For 30 days. [j] For 29 days. [k] For 26 days. [l] For 27 days. [n] For 25 days. [o] For 21 days. [p] For 19 days. [q] For 17 days. [r] For 18 days. [s] For 24 days.

Seven lines in this table are graphically represented in Diagram XII., opposite this page.

DIAGRAM XII.—OZONE, NIGHT, BY MONTHS IN 1880.



* SCALE, 1 DEGREE OF COLORATION (ON A SCALE OF 10 DEGREES) TO 1.2 INCHES VERTICALLY.

Drawn by H. B. Turner

Designed by Henry B. Baker

EXHIBIT 43.—*Comparison by Year and Months of the Average Amount of Ozone in the Air, by the Day Observation, at 17 Stations in 1880, with the Average at 13 Stations in 1879.*—Test-paper Exposed from 7 A. M. to 2 P. M. Daily.*

YEARS, ETC.	OZONE BY DAY.—DEGREES OF COLORATION OF TEST-PAPER.†												
	Ann. Av.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 13 Stations in 1879...*	2.85	3.62	3.58	3.49	3.12	2.85	2.24	2.28	2.30	2.48	2.44	2.87	2.89
Av. for 17 Stations in 1880...*	3.25	2.54	3.69	3.68	3.83	3.33	3.25	3.14	3.00	2.78	2.29	3.30	3.53
In 1880 **Greater** than in 1879....	.40	......	.11	.19	.71	.48	1.01	.86	.70	.30	.55	.43	.64
In 1880 **Less** than in 1879....	......	1.08	......	......	......	......	......	......	......	......	......	......	......

* Ten of the stations, namely, Alpena, Thornville, Lansing, Otisville, Niles, Battle Creek, Kalamazoo, Mendon, Tecumseh, and Washington, were the same for both years; three, Petoskey, Nirvana, and Woodmere Cemetery, near Detroit, were included in the average for 1879, but not in that of 1880; and six, Marquette, Grand Haven, Ionia, Adrian, Ann Arbor, and Coldwater, were included in the average for 1880, but not in that for 1879.

† By a scale of 10 degrees of coloration of Schönbein's test-paper,—maximum of scale=10. The tinted scale is printed on page 142 of the Report of the Michigan State Board of Health for 1875.

EXHIBIT 44.—*Comparison by Year and Months of the Average Amount of Ozone in the Air, by the Night Observation, at 17 Stations in 1880, with the Average at 13 Stations in 1879,*—Test-paper exposed from 9 P. M. to 7 A. M.*

YEARS, ETC.	OZONE BY NIGHT.—DEGREES OF COLORATION OF TEST-PAPER.†												
	Annual Av.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 13 Stations in 1879.*..	2.94	3.98	4.18	4.14	3.41	2.82	2.26	1.91	1.59	2.26	2.39	3.14	3.25
Av. for 17 Stations in 1880.*..	3.13	3.84	4.75	4.69	4.37	3.89	3.35	2.77	2.40	1.88	3.13	3.75	4.11
In 1880 **Greater** than in 1879...	.19	......	.57	.55	.96	1.07	1.09	.86	.81	......	.74	.61	.86
In 1880 **Less** than in 1879...	......	.14	......	......	......	......	......	......	......	.38	......	......	......

* Ten of the Stations, namely,—Alpena, Thornville, Lansing, Otisville, Niles, Battle Creek, Kalamazoo, Mendon, Tecumseh, and Washington, were the same for both years; three, Petoskey, Nirvana, and Woodmere Cemetery (near Detroit), were included in the average for 1879, but not in that for 1880; and six, Marquette, Grand Haven, Ionia, Adrian, Ann Arbor, and Coldwater were included in the average for 1880, but not in that for 1879.

† By a scale of ten degrees of coloration of Schonbein's test-paper,—maximum of scale = 10. The tinted scale is printed on page 142 of the Report of the Michigan State Board of Health for 1875.

For a part of the year 1879 and for 1880, in addition to the usual observations of ozone, from 7 A. M. to 2 P. M. and from 9 P. M. to 7 A. M., another daily observation was taken at the office of State Board of Health, from 2 P. M. to 9 P. M. The annual and monthly results of the three daily observations are given in Exhibit 45, below.

EXHIBIT 45.—*Ozone at Lansing, Michigan, in 1879 and 1880, by year and months, Compiled from Records of Three Daily Observations at the Office of the State Board of Health.*

YEAR AND MONTHS.	DEGREE OF COLORATION OF TEST-PAPER.*							
	1879.				1880.			
	Average.	7 A. M. to 2 P. M.	2 P. M. to 9 P. M.	9 P. M. to 7 A. M.	Average.	7 A. M. to 2 P. M.	2 P. M. to 9 P. M.	9 P. M. to 7 A. M.
Year	3.35	3.14	† 3.37	3.58	3.74	3.70	3.36	4.14
January	3.62	3.36	--------	3.87	2.84	2.90	2.45	3.16
February	4.09	3.41	--------	4.77	4.38	4.38	3.79	4.97
March	4.15	3.79	--------	4.50	3.69	3.42	3.84	3.81
April	2.71	2.62	--------	2.80	4.41	4.28	4.02	4.93
May	2.75	2.69	--------	2.80	3.97	3.81	3.77	4.32
June	2.29	1.97	--------	2.60	3.63	3.53	3.50	3.87
July	3.55	3.81	3.27	3.56	3.40	3.39	3.19	3.61
August	3.29	3.74	3.65	2.48	2.77	2.90	2.55	2.87
September	3.25	3.17	3.07	3.50	3.28	3.73	2.50	3.60
October	3.13	2.73	3.13	3.52	3.16	3.19	2.58	3.71
November	4.05	3.53	4.00	4.63	4.77	4.33	4.37	5.60
December	3.31	2.97	3.10	3.87	4.54	4.55	3.81	5.26

* By a scale of 10 degrees of coloration of Schonbein's Test-paper, maximum of scale = 10°.
† Average for six months.

VELOCITY AND DIRECTION OF THE WIND.

It has been customary to think of March as the month in which the wind attains the greatest velocity, but a reference to a diagram on page 375 of the Report of this Board for 1879, shows that the highest average velocity in any month in 1878 was in April. This is again found true in the curve representing the velocity of wind for 1880, in Diagram XIII., page 455 of this Report. In 1879, observations of the velocity of wind were not made for the months of January and February, owing to difficulty in securing a position for the anemometer on the new capitol building. Such months as are comparable, however, may be studied in the first two figure-columns in Table X. It will be seen that the velocity in March was nearly the same in 1880 as in 1879; in April the average velocity in 1880 was over four miles per hour greater than in 1879; it was also greater in May and June; it was less in July, August, September, and October, and much less in November and December. In 1879 the least average recorded velocity occurred in June, in which month it was 6.8 miles per hour; in 1880 the least average velocity occurred in August, and was 5.9 miles per hour.

By comparing the statements in Table I. on page 317 of the Report for 1880 with those in Table X. on page 352 of the same Report, it will be seen that the highest monthly average temperature in 1879 was in July, and the lowest average velocity of the wind was in June; by the same comparison for the year 1880 between Table I. page 418, and Table X. page 456 of this Report, the highest average temperature, as in 1879, is found to have been in July, while the lowest average velocity of wind was in August.

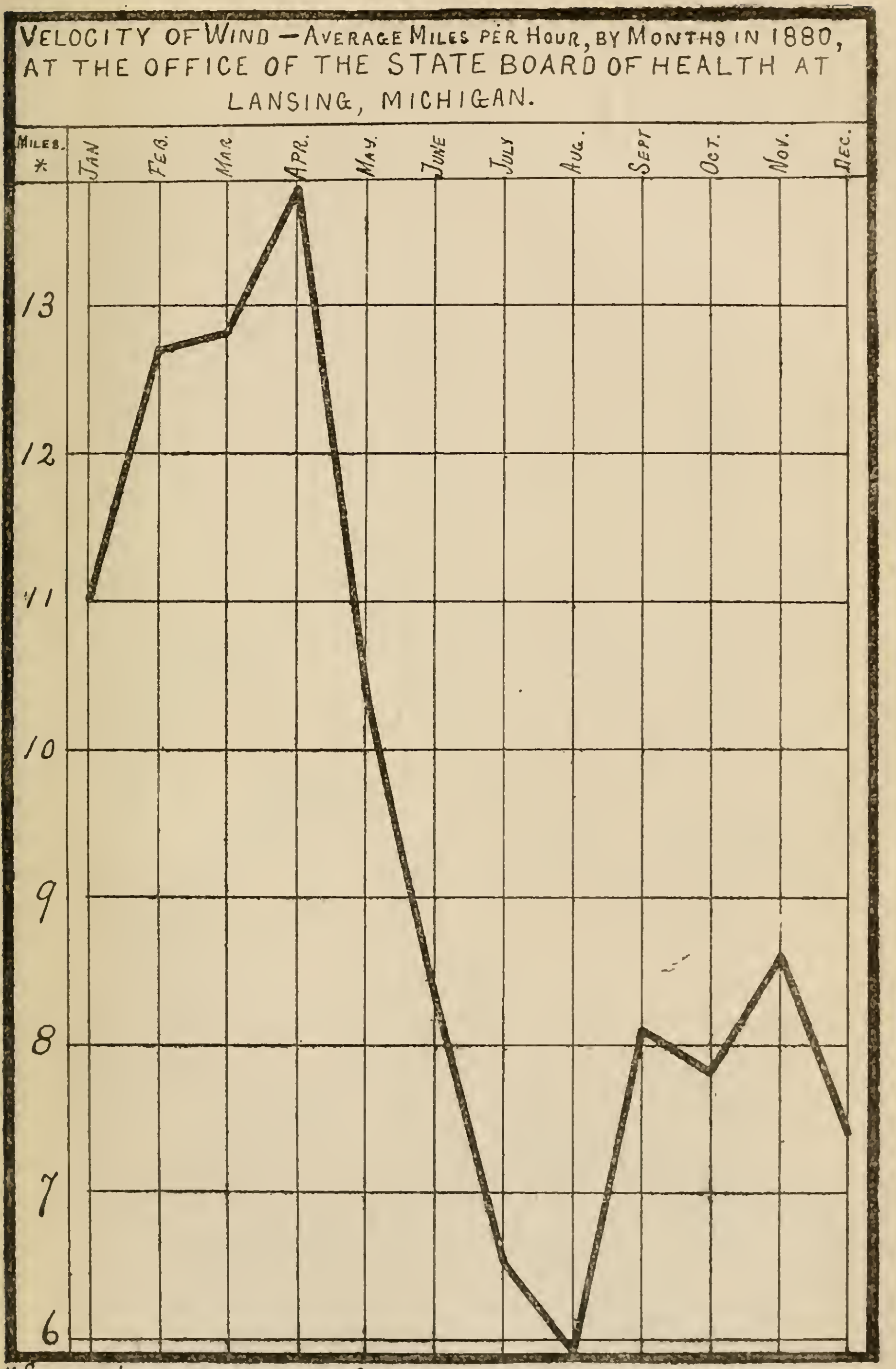
The average velocity of wind per hour by months is graphically shown in Diagram XIII., page 455; and the average velocity per hour by hours of the day and in each month in 1880 is given in Diagram XIV., page 457. Compared with the curves representing day and night ozone there is found to be a general but not a very close correspondence between the velocity of the wind and the relative amount of ozone detected in the atmosphere.

Comparing the curve for the velocity of the wind shown in Diagram XIII. with curves representing pneumonia and bronchitis, in Diagram 1, page 308, and with curves representing influenza and tonsilitis, in Diagram 2, page 382, it may be seen that there is a general but not a very close correspondence in the several lines.

By referring to Table XI., on page 354 of the Report for 1880 and Table XI., page 458 of this Report, it will be seen that the average number of calms per month was less in 1880 than in 1879, perhaps because of closer observations, and the average number of observations at which the wind was blowing from the north, southeast, and northwest, was less in 1880, while the average from south and southwest was greater in 1880 than in 1879. The average for the northeast, east, and west was the same in both years.

The relative frequency with which the wind blew from each direction, at each of the 16 stations for which reports of the wind are compiled, is graphically shown for each month in Diagram XVII., page 460 of this Report. A summary for each station for the year is exhibited in Diagram XVI., page 459, and for all the stations combined, for each month and for the entire year 1880, in Diagram XV., page 459.

DIAGRAM XIII.—VELOCITY OF THE WIND, BY MONTHS IN 1880.



*SCALE, 1 MILE PER HOUR TO .8 OF AN INCH VERTICALLY.

Drawn by H. B. Turner

Designed by Henry B. Baker.

TABLE X.—*Average Velocity of the Wind, in Miles per Hour, during each Hour of the Day, by Months, for the Year 1880.—Compiled from Registers of the Robinson's Self-Registering Anemometer in the Office of the State Board of Health, State Capitol, Lansing, Michigan.*

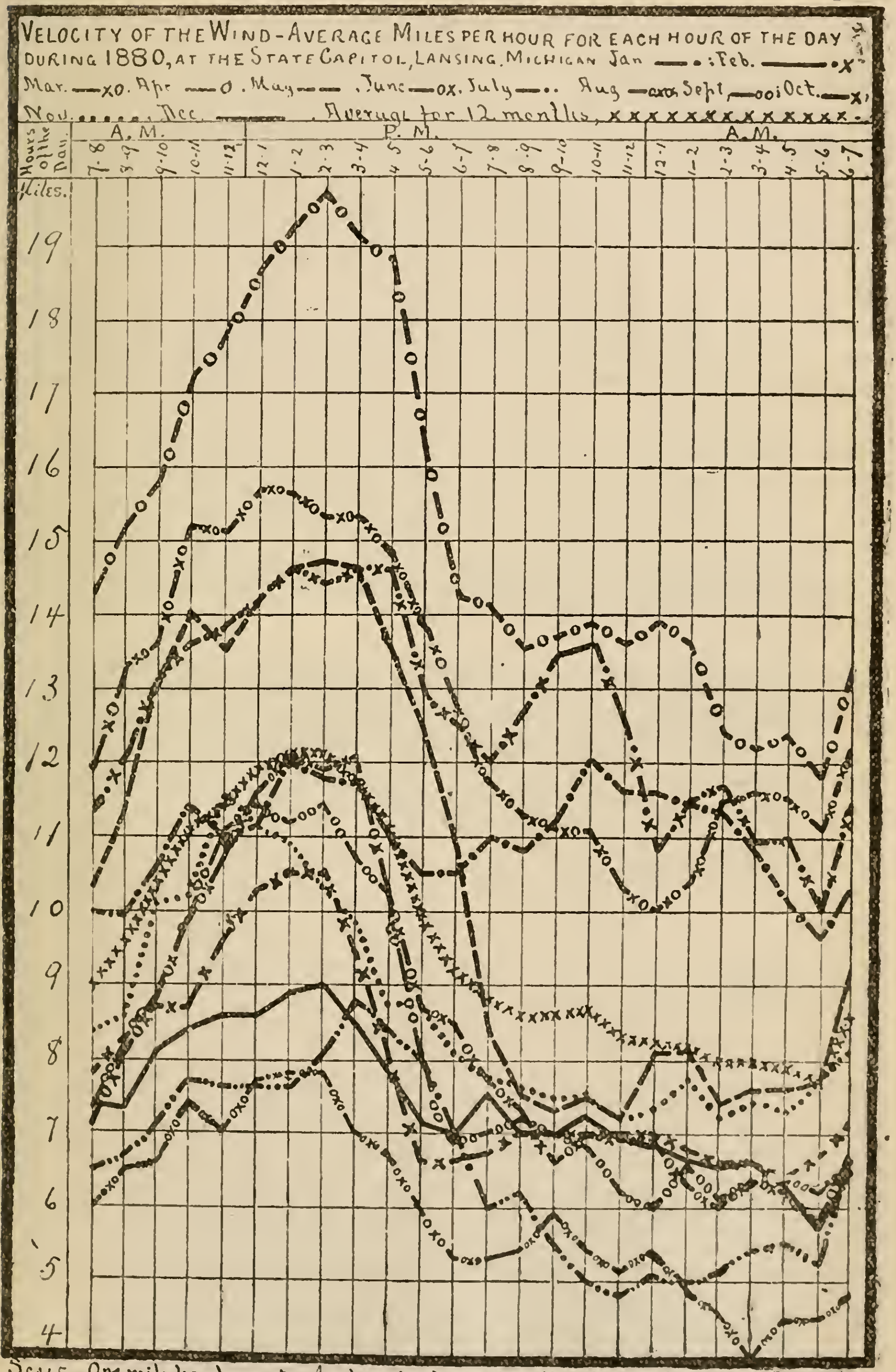
MONTHS.	AVERAGE.		HOURS (1880), AND AVERAGE MILES PER HOUR.																						
			A. M.					P. M.												A. M.						
	1879.	1880.	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7
YEAR, 1880	*	9.5	9.0	9.6	10.4	11.1	11.4	11.9	12.1	12.1	11.8	11.1	9.9	9.2	8.8	8.6	8.6	8.7	8.3	8.2	8.2	8.0	8.0	7.9	7.7	8.6
January	.....	11.0	10.0	9.9	10.6	11.4	11.0	11.1	12.0	11.8	11.7	11.0	10.5	10.5	11.0	10.8	11.2	12.0	11.6	11.6	11.4	11.3	10.8	10 1	9.6	10.3
February	.....	[d]12.6	11.3	12.1	13.1	13.6	13.8	14.2	14.6	14.4	14.6	14.6	12.9	12.5	12.0	12.7	13.5	13.6	12.5	10.8	11.5	11.7	10.9	11.0	10.0	11.5
March	[a]12.4	[e]12.8	11.9	13.3	13.6	15.2	15.1	15.7	15.6	15.3	15.3	14.8	13.8	12.7	11.7	11.3	11.1	11.1	10.3	10.0	10.4	11.5	11.6	11.5	11.1	12.2
April	9.6	13.8	14.3	15.2	15.8	17.2	17 8	18.7	19.3	19.7	19.1	18.8	16.2	14.2	14.1	13.5	13.7	13.9	13.6	13.9	13.6	12.4	12.2	12.4	11.8	13.3
May	7.4	10.4	10.3	11.3	13.1	14.0	13 5	14.2	14.6	14.7	14.6	13.5	12.4	10.8	8.4	7.5	7.3	7.5	7.2	8.1	8.1	7.4	7.6	7.6	7.7	9.2
June	6.8	8.3	7.1	8.1	8.8	9.9	10.7	11.6	12.0	11.9	12.1	10.2	8.7	8.5	7.7	7.3	6.6	7.0	6.9	6.9	6.3	6.0	6.4	6.2	5.8	6.7
July	8.6	6.5	6.5	6.7	7.1	7.7	7.6	7.6	7.6	8.1	8.8	8.4	8.0	7.0	6 0	6.2	5.5	5.0	4 8	5.1	5.0	5.1	5.4	5.5	5.2	6.6
August	8.4	5.9	6.0	6.5	6.6	7.4	7.0	7.7	7.8	7.8	7.0	6.7	6.0	5.3	5.3	5.4	5.9	5.4	5.1	5.4	4.8	4.6	4.0	4.5	4.5	4.8
September	[b]10.0	8.1	7.3	8.2	8.8	9.8	11.1	11.4	11.2	11.4	10.7	10 3	8.1	6.9	7.0	7.2	7.0	6.8	6.2	6.0	6.6	6.1	6.3	6.4	6.2	6.6
October	[c]10.2	7.8	7.8	8.3	8.7	8.7	9.6	10.3	10.5	10.5	9.4	8.1	6.6	6.6	6.7	7.0	7.0	7.0	7.0	7.0	6.8	6.6	6.6	6.4	6.7	7.2
November	12 2	8.6	8.4	8.6	10.1	10.2	11.5	11.1	10.9	10.3	9.8	8.7	8.7	8.1	7.7	7.6	7.5	7.5	7.2	7.3	7.7	7.2	7.4	7.3	7.7	8.1
December	11.3	7.4	7.4	7.3	8.1	8.4	8.6	8.6	8.9	9.0	8.5	7.8	7.1	7.0	7.5	7.0	7.0	7.2	6.9	6.8	6.6	6.5	6.6	6.3	5.7	6.5

* The average for the 10 months, March to December, 1879, was 9.7.

[a] For only about 27 days. [b] For only about 28 days. [c] For only about 30 days. [d] For only about 26 days. [e] For only about 29 days.

The statements in the second figure-column in Table X. of the average velocity of the wind, in miles per hour, are graphically represented in Diagram XIII. page 455; the remaining columns of Table X. are graphically represented in Diagram XIV. opposite this page.

DIAGRAM XIV.—AV. VELOCITY OF WIND EACH HOUR, BY MONTHS, 1880.



Scale - One mile per hour to .4 of an inch vertically. Designed by Henry B. Baker. Drawn by H. B. Turner

TABLE XI.—*Number of Observations per Month (at 7 A. M., 2 P. M., and 9 P. M., daily), at which the Wind was Blowing from each of the Eight Principal Points of Compass, during the Year and during each Month of the Year 1880,—Average for 19 Stations in Michigan.**

POINTS OF COMPASS.	AVERAGE NUMBER OF OBSERVATIONS PER MONTH, 1880.												
	Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
All Observations.	91	93	87	93	90	93	89	93	93	90	92	90	93
Calm	4	3	3	2	2	4	5	6	6	4	3	3	2
North	5	5	5	9	6	4	3	6	7	5	5	2	8
North-east	7	6	4	8	7	6	6	8	15	5	6	2	7
East	5	6	2	6	7	6	4	4	9	3	3	3	4
South-east	8	12	8	13	7	7	8	7	10	5	7	9	4
South	12	16	14	8	7	13	12	11	10	14	16	11	7
South-west	22	22	23	14	23	30	23	22	18	21	21	24	21
West	16	10	14	16	13	14	18	17	10	19	13	24	24
North-west	13	12	15	15	19	10	10	12	9	14	17	11	15

Graphic representations of statements in Tables XI. and XII. are given in Diagrams XV. and XVI., opposite this page.

TABLE XII.—*Average Number of Observations per Month, for the Year 1880, at which the Wind was Blowing from each of the Eight Principal Points of Compass, at each of 19 Stations in Michigan; also the Average for all said Stations.**

STATIONS IN MICHIGAN.*	Divisions of the State.†	AVERAGE NUMBER OF OBSERVATIONS PER MONTH, IN 1880.									
		All Obs.	Calms.	N.	N. E.	E.	S. E.	S.	S. W.	W.	N. W.
Average, 19 Stations	--------	91	4	6	7	5	8	12	22	16	13
Escanaba	U. P.	92	4	18	4	4	7	21	13	10	12
Marquette	U. P.	92	1	10	7	6	7	12	11	18	20
Alpena	N. E.	91	3	8	3	5	15	10	12	19	17
Grand Haven	W.	92	1	4	8	11	11	16	16	15	9
Nirvana and Reed City	W.	91	0	6	6	5	9	12	23	16	15
Port Huron	B. & E.	91	1	9	10	4	7	21	17	15	8
Thornville	B. & E.	91	7	2	6	1	8	2	26	11	28
Ionia	C.	92	0	2	13	7	5	3	37	17	8
Lansing	C.	92	3	3	9	3	11	8	24	23	8
Otisville	C.	89	5	4	4	3	15	9	17	15	18
Niles	S. W.	91	0	3	3	2	7	2	37	19	18
Ann Arbor	S. C.	91	3	5	6	7	9	13	21	17	10
Battle Creek	S. C.	92	0	2	6	5	8	14	21	15	19
Hillsdale	S. C.	92	0	4	5	4	9	21	27	19	10
Kalamazoo	S. C.	92	2	3	6	3	8	13	37	9	12
Mendon	S. C.	90	0	6	8	6	6	20	20	15	9
Tecumseh	S. C.	92	9	4	5	6	6	9	17	23	14
Detroit	S. E.	92	0	6	10	8	3	10	30	16	9
Washington	S. E.	92	28	6	7	2	5	7	13	15	9

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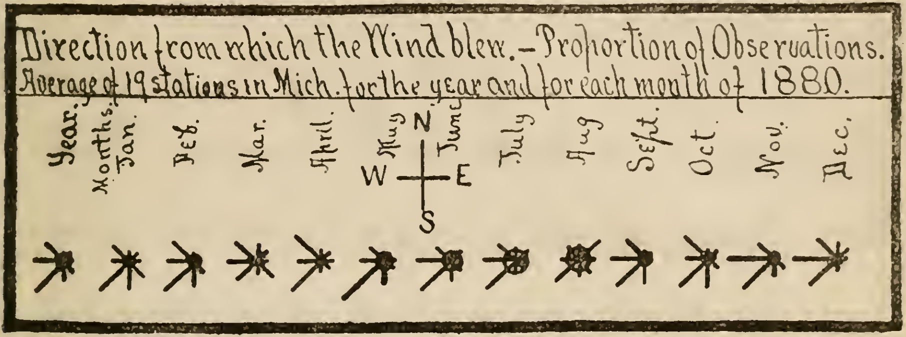
* The names of observers, their places of observation, and the counties, and divisions of the State, in which these places are situated, are stated in Exhibit 7, page 306.

† The full names of the divisions, and the counties in each division, are stated in Exhibit 1, p. 227.

DIAGRAM XV.—DIRECTION OF THE WIND IN MICH., BY MONTHS, IN 1880.



Explanations of the construction and manner of reading Diagrams XV., XVI., and XVII. are given on page 411. For convenience of study, the top of each of these diagrams should be held toward the north; the scale is such that each one-hundredth of an inch on the converging lines represents one observation of the wind blowing from the direction indicated by the line, toward the centre of each figure. Calms are represented by the radius of each circle. Comments on the subject of the direction and the velocity of the wind are printed on page 454.

DIAGRAM XVI.—DIRECTION OF WIND AT STATIONS IN MICHIGAN, 1880.

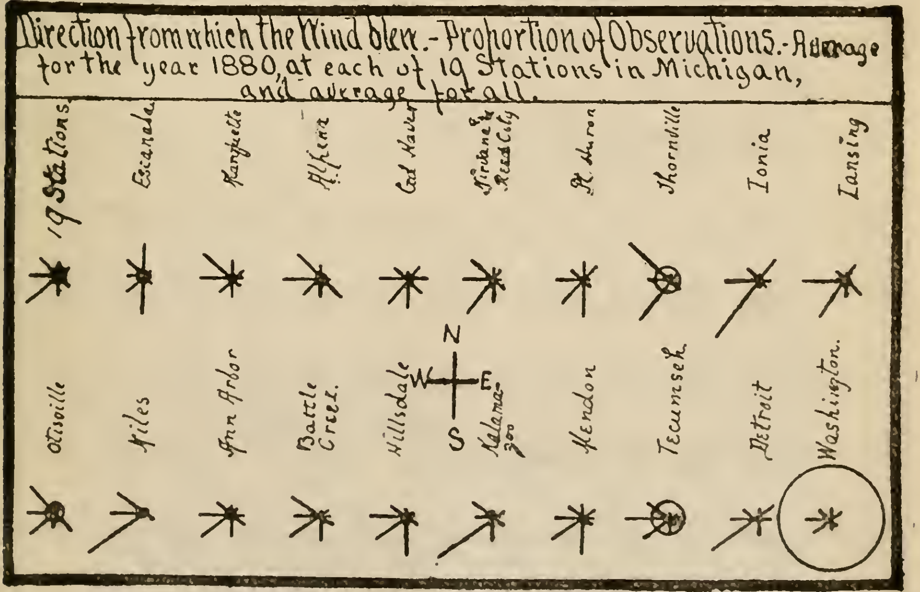
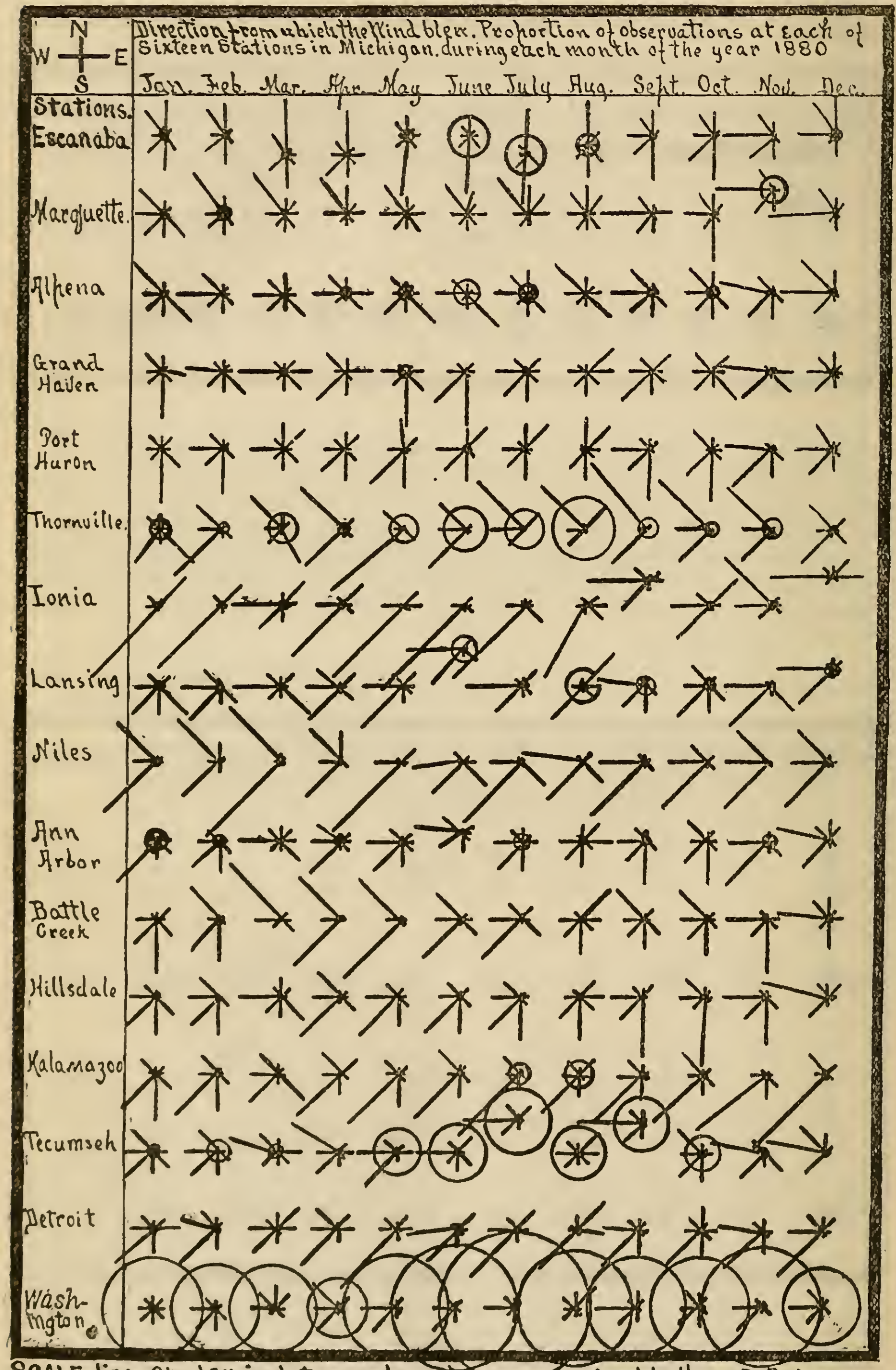


DIAGRAM XVII.—WIND, DIRECTION, AT STATIONS, BY MONTHS IN 1880.



SCALE, line .01 of an inch to one observation. Designed by Henry B. Baker.
Drawn by H. B. Turner.

TABLE XIII.—*Number of Observations for each Month of the Year 1880, at which the Wind was Blowing from each of the Eight Principal Points of Compass, at each of 23 Stations* in Michigan; also the average for the 19 of said Stations from which nearly Complete Observations were received for the Year.* (*Observations made at 7 A. M., 2 P. M., and 9 P. M., Daily.*)

STATIONS IN MICHIGAN.*	DIVISIONS OF THE STATE.†	JANUARY.										FEBRUARY.										MARCH.									
		Total.	Calm.	N.	N. E.	E.	S. E.	S.	S. W.	W.	N. W.	Total.	Calm.	N.	N. E.	E.	S. E.	S.	S. W.	W.	N. W.	Total.	Calm.	N.	N. E.	E.	S. E.	S.	S. W.	W.	N. W.
Average for 19 Stations ...‡	......	93	3	5	6	6	12	16	22	10	12	87	3	5	4	2	8	14	23	11	15	93	2	9	8	6	13	8	14	16	15
Escanaba......*	U. P.†	93	3	19	5	2	11	19	12	6	16	87	2	17	4	1	5	16	16	9	17	93	2	30	3	5	7	18	12	3	13
Marquette......	U. P.	93	0	7	5	1	16	13	15	17	19	87	4	9	2	2	8	12	12	10	28	93	0	9	9	7	9	11	8	11	29
Alpena	N. E.	93	1	6	3	1	22	13	12	12	23	87	1	5	4	4	8	11	12	26	16	93	0	12	5	7	17	9	13	18	12
Grand Haven...	W.	93	2	9	4	13	8	26	10	8	13	87	1	6	5	6	18	12	12	20	7	93	2	4	8	16	14	11	6	25	7
Nirvana and Reed City..§	W.	93	0	6	13	15	7	7	25	8	12	87	1	6	7	5	10	3	28	15	12	93	0	7	16	8	15	5	28	6	8
Port Huron	B.&E.	93	0	7	9	5	15	30	8	9	10	87	0	5	4	1	8	25	14	19	11	93	0	14	16	5	11	13	8	19	7
Thornville......	B.&E.	93	6	7	3	5	27	8	23	4	10	87	3	0	4	0	7	5	36	13	19	93	8	8	5	0	22	1	13	11	25
Ionia............	C.	93	0	2	21	0	0	2	54	7	7	87	0	3	16	3	1	4	49	3	8	93	0	7	17	7	3	9	19	28	3
Lansing..........	C.	93	0	2	6	4	22	15	21	14	9	87	0	4	3	0	13	9	25	21	12	93	0	6	10	4	22	6	9	26	10
Otisville	C.	93	3	4	5	5	25	11	15	11	14	86	6	6	2	1	16	13	13	9	20	89	4	11	1	2	21	4	13	10	23
Benton Harbor.	S. W.	88	10	7	4	9	10	16	6	16	10	86	12	3	2	3	8	19	11	14	14	92	9	3	3	5	13	15	11	16	14
Niles............	S. W.	93	0	1	0	0	2	3	42	14	31	87	0	10	2	0	1	7	29	6	32	93	0	4	2	0	3	2	38	3	41
Adrian..........	S. C.	86	16	1	2	13	4	26	6	18	0	83	13	2	0	5	4	27	13	18	1	92	22	7	8	13	5	3	11	15	8
Ann Arbor......	S. C.	92	7	3	5	9	12	11	33	5	7	85	4	2	3	4	10	19	21	13	9	92	1	9	10	10	17	5	8	23	9
Battle Creek ...	S. C.	93	0	3	9	4	12	30	19	12	4	87	0	2	3	0	4	24	24	7	23	93	0	0	5	6	11	0	5	15	41
Coldwater......	S. C.	93	0	1	4	4	19	10	33	11	11	87	0	0	1	1	10	5	36	12	22	93	0	2	10	6	12	3	22	21	11
Hillsdale	S. C.	93	0	4	3	3	15	21	23	15	9	87	0	4	0	1	8	20	22	17	15	93	0	10	8	3	18	12	13	23	6
Hudson..........	S. C.	86	2	4	0	5	9	13	21	23	6	81	4	3	0	4	3	18	10	22	17	93	2	8	10	8	13	2	11	28	11
Kalamazoo......	S. C.	93	0	3	6	5	12	27	27	3	10	87	0	1	2	1	8	20	32	10	13	93	0	5	4	4	20	7	23	16	11
Mendon..........	S. C.	91	0	2	4	15	6	26	17	12	9	86	0	7	2	2	4	25	21	16	9	92	0	9	13	3	13	18	16	13	7
Tecumseh	S. C.	93	3	0	3	8	13	12	21	16	17	87	6	1	0	4	8	14	21	19	14	93	5	7	1	15	10	7	10	25	13
Detroit	S. E.	93	0	4	8	15	2	14	28	13	9	87	0	6	4	2	3	12	28	20	12	93	0	9	17	11	3	9	20	16	8
Washington	S. E.	93	28	7	7	7	8	9	11	9	7	87	24	4	2	0	8	12	15	15	7	93	24	13	11	6	7	2	4	14	12

* The names of observers, their places of observation, and the counties in which these places are situated, are stated in Exhibit 26, page 404.

† The full names of the divisions and the counties in each division, are stated in Exhibit 1, page 257.

‡ This line is an average for only the 19 stations from which statements nearly complete were received for every month of the year; it does not include the lines for Benton Harbor, Adrian, Coldwater, or Hudson.

§ The observations compiled in this line were taken at Nirvana to and including April 25, 1880; after that, at Reed City, about 10 miles from Nirvana.

Graphic representations of statements for 16 lines in this table are given in Diagram XVII., page 460, which is explained on page 411. Comments on velocity and direction of wind in 1880 are printed on page 454.

TABLE XIII.—CONTINUED.—*Direction of Wind, Months in 1880.—Observations at which the Wind was Blowing from Directions Named.*

STATIONS IN MICHIGAN.*	DIVISIONS OF THE STATE.†	APRIL.										MAY.										JUNE.									
		Total.	Calm.	N.	N. E.	E.	S.E.	S.	S.W.	W.	N.W.	Total.	Calm.	N.	N. E.	E.	S.E.	S.	S.W.	W.	N.W.	Total.	Calm.	N.	N. E.	E.	S.E.	S.	S.W.	W.	N.W.
Average for 19 Stations‡	------	90	2	6	7	7	7	7	23	13	19	93	4	4	6	6	7	13	30	14	10	89	5	3	6	4	8	12	23	18	10
Escanaba*	U.P.†	90	6	24	5	9	6	12	16	8	10	93	4	11	5	8	8	33	10	5	9	90	11	11	3	4	9	31	8	6	7
Marquette	U. P.	90	0	16	7	10	6	7	6	13	25	93	0	9	7	9	13	9	12	15	19	90	0	12	6	11	9	10	9	12	21
Alpena	N. E.	89	3	8	4	16	13	4	8	19	14	93	4	6	6	8	23	11	16	7	12	90	8	6	3	6	25	9	5	17	11
Grand Haven	W.	90	1	8	2	16	5	14	23	6	15	93	4	0	5	11	14	30	10	14	5	90	0	2	7	5	3	30	25	11	7
Nirvana and Reed City§	W.	89	3	4	6	9	8	6	28	7	18	93	0	1	1	2	11	18	28	20	12	90	0	4	3	2	5	17	21	22	16
Port Huron	B.&E.	90	0	10	11	4	9	18	18	12	8	92	0	17	10	3	3	23	27	9	0	90	2	11	16	0	6	18	19	17	1
Thornville	B.&E.	90	3	0	8	0	12	3	29	2	33	93	8	0	2	0	9	0	52	6	16	90	12	0	4	0	3	3	31	16	21
Ionia	C.	90	0	0	16	5	7	2	40	15	5	93	0	0	11	11	3	1	55	12	0	90	0	0	6	3	6	3	65	7	0
Lansing	C.	90	0	2	11	2	10	2	26	20	17	93	1	0	11	6	2	9	33	22	9	90	8	0	7	2	10	4	26	32	1
Otisville	C.	89	3	2	3	6	17	3	18	15	22	93	4	3	7	4	12	9	23	22	9	89	5	1	5	1	16	2	21	29	9
Benton Harbor	S.W.	89	20	6	2	0	13	7	12	13	16	89	20	6	7	3	5	15	19	7	7	87	26	4	4	3	5	9	20	9	7
Niles	S.W.	90	0	17	0	1	5	2	28	13	24	93	1	0	11	4	3	0	55	15	4	90	0	0	4	7	18	0	24	29	8
Adrian	S. C.	88	17	0	6	8	3	13	13	20	8	92	21	1	4	8	4	10	20	17	7	86	27	2	0	10	1	12	21	9	4
Ann Arbor	S. C.	90	3	4	7	7	8	4	25	16	16	93	2	1	7	7	8	15	23	20	10	89	1	1	7	5	6	12	15	28	14
Battle Creek	S. C.	90	0	1	2	4	2	1	37	11	32	93	0	1	0	3	3	0	45	8	33	90	0	0	5	6	12	3	30	14	20
Coldwater	S. C.	90	0	1	7	4	4	8	32	14	20	93	0	7	7	4	2	9	41	15	7	90	0	0	8	0	11	11	31	18	11
Hillsdale	S. C.	90	0	2	4	3	12	4	32	15	18	93	0	2	5	5	8	17	30	18	8	90	0	3	7	1	8	21	28	12	10
Hudson	S. C.	90	6	2	8	6	8	0	20	22	18	93	10	3	11	5	8	2	31	16	7	90	21	3	10	2	10	0	17	18	9
Kalamazoo	S. C.	[illegible]	0	0	12	1	5	12	34	10	16	93	1	3	6	4	6	19	38	6	10	90	1	3	4	2	8	14	35	6	17
Mendon	S. C.	81	0	4	5	11	1	13	12	19	16	92	0	5	6	5	4	29	21	13	9	82	1	6	4	5	0	26	17	13	10
Tecumseh	S. C.	90	2	0	6	9	4	7	18	13	31	93	13	2	5	9	1	5	27	22	9	90	16	1	11	2	10	10	9	23	8
Detroit	S. E.	90	0	2	10	10	0	8	29	15	16	93	1	3	10	9	1	6	44	10	9	90	1	1	13	6	3	11	24	28	3
Washington	S. E.	90	16	4	9	3	5	3	17	14	19	93	29	3	7	2	4	7	18	20	3	90	35	2	6	0	4	8	17	13	5

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* The names of observers, their places of observation, and the counties in which these places are situated, are stated in Exhibit 26, page 404.

† The full names of the divisions and the counties in each division are stated in Exhibit 1, page 257.

‡ This line is an average for only the 19 stations from which statements nearly complete were received for every month of the year; it does not include the lines for Benton Harbor, Adrian, Coldwater, or Hudson.

§ The observations compiled in this line were taken at Nirvana up to and including April 25, 1880; after that at Reed City, about 10 miles from Nirvana.

Graphic representations of statements for 16 lines in this table are given in Diagram XVII., page 460, which is explained on page 411.

TABLE XIII.—CONTINUED.—*Direction of Wind, Months in 1880.—Observations at which the Wind was Blowing from Directions Named.*

STATIONS IN MICHIGAN.*	DIVISIONS OF THE STATE.†	JULY.										AUGUST.										SEPTEMBER.									
		Total.	Calm.	N.	N. E.	E.	S. E.	S.	S. W.	W.	N. W.	Total.	Calm.	N.	N. E.	E.	S. E.	S.	S. W.	W.	N. W.	Total.	Calm.	N.	N. E.	E.	S. E.	S.	S. W.	W.	N. W.
Average for 19 Stations....‡	......	93	6	6	8	4	7	11	22	17	12	93	6	7	15	9	10	10	18	10	9	90	4	5	5	3	5	14	21	19	14
Escanaba......*	U. P.†	93	11	25	1	0	8	26	10	4	8	93	6	24	9	5	13	18	11	4	3	90	1	14	4	2	2	25	15	15	12
Marquette......	U. P.	93	0	16	14	12	1	7	8	9	26	93	2	15	13	5	11	9	11	12	15	90	0	5	4	11	3	11	14	29	13
Alpena..........	N. E.	93	5	12	4	4	14	13	9	18	14	93	0	9	5	8	19	7	9	13	23	90	3	5	1	4	11	13	15	21	17
Grand Haven...	W.	93	2	2	10	7	8	17	19	18	10	93	1	4	20	16	10	14	11	11	6	90	1	1	14	6	9	13	24	13	9
Nirvana and Reed City. §	W.	93	0	4	8	1	7	13	16	21	23	90	0	8	12	5	22	5	14	9	15	90	0	10	1	0	5	15	28	10	21
Port Huron.....	B. & E.	93	1	14	19	4	4	18	14	14	5	93	2	18	19	9	6	17	14	4	4	90	1	4	6	1	4	28	16	22	8
Thornville......	B. & E.	92	11	0	12	0	0	0	13	19	37	93	17	1	17	0	2	0	13	10	33	90	6	0	3	0	0	0	28	5	48
Ionia	C.	93	0	3	4	3	13	0	56	11	3	93	0	0	11	12	13	4	44	4	5	90	0	3	7	9	1	5	22	33	10
Lansing..........	C.	93	2	3	12	3	7	6	21	33	6	93	10	4	24	8	9	3	26	7	2	90	6	4	5	1	8	15	19	27	5
Otisville..........	C.	92	8	2	5	4	12	12	14	15	20	89	9	2	14	9	12	4	17	9	13	84	4	3	2	3	9	8	12	14	29
Benton Harbor.	S. W.	88	21	14	1	0	10	6	15	9	12	79	21	9	4	2	13	3	11	9	7	86	27	2	8	0	8	2	23	5	11
Niles	S. W.	93	0	1	1	0	18	3	47	19	4	93	1	0	8	0	16	1	30	33	4	90	0	4	2	0	7	4	42	26	5
Adrian..........	S. C.	76	25	4	6	1	0	13	10	11	6	88	23	8	15	8	1	14	6	9	4	89	29	7	2	0	2	15	20	12	2
Ann Arbor......	S. C.	93	5	8	5	9	4	17	21	16	8	93	1	9	13	17	7	15	14	13	4	90	2	4	2	4	8	24	15	15	9
Battle Creek...	S. C.	93	0	1	9	3	14	3	33	19	11	93	0	0	23	11	9	19	14	12	5	90	0	3	7	3	12	17	13	13	22
Coldwater	S. C.	92	0	0	8	3	4	8	27	25	17	93	0	3	4	3	10	20	31	16	6	90	0	5	3	0	6	36	16	16	8
Hillsdale.........	S. C.	93	0	3	3	6	6	24	23	16	12	93	0	1	12	13	10	24	17	10	6	90	0	3	7	1	0	34	18	19	8
Hudson..........	S. C.	......	......	..	......	..	....	..	......	...	......	93	23	6	9	15	7	1	15	13	4	90	25	9	1	2	1	6	20	21	5
Kalamazoo......	S. C.	93	6	2	4	2	5	8	47	7	12	93	8	3	12	6	4	13	30	9	8	90	1	6	3	3	1	14	36	15	11
Mendon..........	S. C.	93	0	3	9	6	4	29	11	25	6	92	0	9	17	11	11	21	14	8	1	89	0	9	11	4	3	17	20	16	9
Tecumseh	S. C.	93	18	2	10	2	1	5	13	31	11	93	15	5	16	11	8	6	11	13	8	90	15	8	1	0	1	9	13	34	9
Detroit..........	S. E.	93	2	2	15	6	0	7	36	17	8	93	1	8	23	16	4	3	29	6	3	90	0	6	6	5	4	14	28	19	8
Washington	S. E.	93	42	4	4	2	1	8	6	18	8	93	32	9	16	3	5	3	10	7	8	90	27	8	5	0	2	8	13	22	5

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* The names of observers, their places of observation, and the counties in which these places are situated, are stated in Exhibit 26, page 404.

† The full names of the divisions and the counties in each division, are stated in Exhibit 1, page 257.

‡ This line is an average for only the 19 stations from which statements nearly complete were received for every month of the year; it does not include the lines for Benton Harbor, Adrian, Coldwater, or Hudson.

§ The observations compiled in this line were taken at Nirvana to and including April 25, 1880; after that, at Reed City, about 10 miles from Nirvana.

Graphic representations of statements for 16 lines in this table are given in Diagram XVII., page 460, which is explained on page 411. Comments on velocity and direction of wind in 1880 are on page 454.

TABLE XIII.—CONTINUED.—*Direction of Wind, Months in 1880.—Observations at which the Wind was Blowing from Directions Named.*

STATIONS IN MICHIGAN.*	DIVISIONS OF THE STATE.†	OCTOBER.										NOVEMBER.										DECEMBER.									
		Total.	Calm.	N.	N. E.	E.	S.E.	S.	S. W.	W.	N.W.	Total.	Calm.	N.	N. E.	E.	S.E.	S.	S. W.	W.	N.W.	Total.	Calm.	N.	N. E.	E.	S.E.	S.	S.W.	W.	N.W.
Average for 19 Stations....‡	------	92	3	5	6	3	7	16	21	13	17	90	3	2	2	3	9	11	24	24	11	93	2	8	7	4	4	7	21	21	15
Escanaba.......*	U.P.†	93	0	13	4	3	2	24	21	12	14	90	0	7	2	2	5	13	19	28	14	93	3	21	1	3	2	12	7	22	22
Marquette......	U. P.	93	0	11	7	2	5	26	10	17	15	90	7	2	1	3	1	12	18	32	14	93	1	9	7	0	3	11	8	37	17
Alpena..........	N. E.	93	3	10	4	0	12	15	14	16	19	90	1	2	0	2	9	15	19	30	12	93	1	12	2	1	3	5	17	27	25
Grand Haven...	W.	93	0	3	12	7	20	8	16	12	15	90	0	2	2	13	15	4	21	29	4	93	2	11	7	15	4	10	16	16	12
Nirvana and Reed City..§	W.	93	0	4	2	1	4	23	30	12	17	90	0	1	0	6	10	18	16	35	4	93	0	12	0	4	5	8	18	25	21
Port Huron.....	B.&E	93	0	7	5	6	7	28	20	4	16	90	0	1	2	3	9	16	29	26	4	93	0	4	6	1	5	12	22	25	18
Thornville.......	B.&E.	93	4	0	0	0	1	1	26	21	40	90	6	0	1	0	2	3	25	18	35	93	0	3	11	4	12	5	27	11	20
Ionia............	C.	93	0	2	21	6	3	2	26	22	11	90	0	1	6	4	6	2	12	22	37	93	0	7	15	19	2	0	6	36	8
Lansing..........	C.	93	3	4	5	2	12	15	24	14	14	90	2	0	4	2	16	5	32	26	3	93	4	8	9	4	4	4	25	31	4
Otisville.........	C.	88	4	3	0	0	18	16	19	3	25	85	3	3	0	0	20	12	21	13	13	89	1	3	7	4	1	9	18	27	19
Benton Harbor.	S. W.	84	21	1	6	1	4	8	18	11	14	83	16	2	3	6	4	11	11	23	7	85	29	1	2	1	10	8	7	18	9
Niles............	S. W.	87	0	0	6	1	6	2	36	23	13	90	0	0	0	1	3	0	36	25	25	93	0	4	0	5	3	2	35	21	23
Adrian...........	S. C.	90	20	4	1	4	1	24	14	13	9	89	17	0	0	4	7	13	16	27	5	91	12	3	10	0	0	7	20	32	7
Ann Arbor......	S. C.	92	0	5	7	6	8	25	17	9	15	90	4	5	0	5	11	7	34	21	3	93	0	11	11	2	5	4	20	29	11
Battle Creek...	S. C.	93	0	3	5	4	7	20	16	16	22	90	0	3	2	6	7	30	13	23	6	93	0	11	6	8	2	17	8	28	13
Coldwater......	S. C.	93	0	9	4	2	7	32	16	11	12	90	0	6	2	2	16	8	43	7	6	------	------	--	-----	--	----	--	-----	---	-----
Hillsdale........	S. C.	93	0	5	4	2	4	38	11	15	14	90	0	4	0	2	9	27	18	25	5	93	0	6	10	5	4	6	17	37	8
Hudson..........	S. C.	93	17	5	8	4	2	5	23	16	13	89	11	2	3	0	10	11	21	26	5	93	3	5	14	3	0	4	31	24	9
Kalamazoo......	S. C.	93	1	1	4	2	9	12	38	9	17	90	0	3	2	1	9	14	49	8	4	93	1	2	7	1	5	1	56	6	14
Mendon..........	S. C.	93	1	6	7	9	9	14	17	13	17	87	0	2	6	4	8	14	34	16	3	93	0	4	16	0	8	5	37	15	8
Tecumseh......	S. C.	93	10	5	3	5	3	16	19	13	19	90	3	3	2	2	14	8	19	30	9	93	0	10	5	3	3	3	17	33	19
Detroit...........	S. E.	93	0	13	4	8	6	14	27	10	11	90	0	5	1	7	4	13	29	24	7	93	0	7	9	1	3	4	37	19	13
Washington.....	S. E.	93	27	7	6	1	6	11	14	10	11	90	33	3	2	0	8	4	18	16	6	93	21	4	5	0	5	7	12	18	11

* The names of observers, their places of observation, and the counties in which these places are situated, are stated in Exhibit 26, page 404.

† The full names of the divisions and the counties in each division are stated in Exhibit 1, page 257.

‡ This line is an average for only the 19 stations from which statements nearly complete were received for every month of the year; it does not include the lines for Benton Harbor, Adrian, Coldwater, or Hudson.

§ The observations compiled in this line were taken at Nirvana to and including April 25, 1880; after that, at Reed City, about 10 miles from Nirvana.

Graphic representations of statements for 16 lines in this table are given in Diagram XVII., page 460, which is explained on page 411.

EXHIBIT 46.—*Comparison by Year and Months of the Average Atmospheric Pressure, at 14 Stations in 1880, with the Average at 13 Stations in 1879.**

YEARS, ETC.	AVERAGE ATMOSPHERIC PRESSURE,—INCHES OF MERCURY.												
	Annual Av.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 13 Stations in 1879...	29.155	29.169	29.173	29.163	29.122	29.176	29.121	29.091	29.106	29.188	29.221	29.152	29.176
Av. for 14 Stations in 1880...	29.133	29.134	29.105	29.191	29.048	29.092	29.085	29.106	29.163	29.153	29.150	29.231	29.139
In 1880 **Greater** than in 1879...	....	......	......	.028	......	......	......	.015	.057	......	......	.079	......
In 1880 **Less** than in 1879...	.022	.035	.068	......	.074	.084	.036	......	......	.035	.071	......	.037

* Eleven of the Stations, namely, Marquette, Alpena, Grand Haven, Port Huron, Lansing, Battle Creek, Kalamazoo, Tecumseh, Detroit, and Washington, were the same for both years. Two, Ypsilanti and Woodmere Cemetery were included in the average for 1879, but not in that for 1880; and two, Escanaba and Thornville, were included in the average for 1880 but not in that for 1879. Nirvana was included in the average for 1879, and in the average for 1880 from Jan. 1 to April 25, inclusive, the average for the rest of the year being made from observations at Reed City, 10 miles from Nirvana.

TABLE XIV.—*Average Atmospheric Pressure, for the Year, and for each Month in the Year 1880, at 15 Stations in Michigan, as indicated by the Height, in inches, of Mercury in the Barometer. Corrected for Temperature,—Reduced to 32° F., (for some Stations not corrected for Instrumental Errors §).—Average of Observations made Daily at 7 A. M., 2 P. M., and 9 P. M., by Observers* for the State Board of Health and for the U. S. Signal Service.*

STATIONS IN MICHIGAN.*	DIVISIONS OF THE STATE.†	INCHES OF MERCURY,—ATMOSPHERIC PRESSURE.														
		YEAR.			MONTHS, 1880.											
		1878.	1879.	1880.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Av. for 14 Stations ‡	--------	a	b	29.133	29.134	29.105	29.191	29.048	29.092	29.085	29.106	29.163	29.153	29.150	29.231	29.139
Escanaba *	U. P.†	--------	--------	29.302	29.293	29.268	29.384	29.220	29.259	29.239	29.294	29.355	29.300	29.303	29.383	29.330
Marquette	U. P.	--------	29.267	29.245	29.213	29.202	29.334	29.190	29.202	29.196	29.253	29.314	29.230	29.237	29.308	29.256
Alpena	N. E.	--------	29.340	29.336	29.336	29.297	29.435	29.241	29.304	29.281	29.311	29.393	29.344	29.351	29.427	29.315
Grand Haven	W.	--------	29.359	29.346	29.330	29.312	29.386	29.254	29.326	29.298	29.309	29.378	29.368	29.370	29.450	29.372
Nirvana and Reed City ‖	W.	--------	29.054	28.924	29.016	28.994	29.106	28.913	28.853	28.839	28.851	28.910	28.914	28.878	28.949	28.860
Port Huron	B. & E.	--------	29.341	29.332	29.340	29.298	29.368	29.233	[d] 29.312	29.287	29.295	29.354	29.352	29.368	29.448	29.330
Thornville	B. & E.	--------	--------	28.930	28.923	28.853	28.955	28,822	28.931	28.905	28.924	28.975	28.963	28.980	29.023	28.910
Lansing	C.	--------	29.045	29.016	28.998	28.973	29.042	28.916	29.002	28.983	28.996	29.052	29.058	29.043	29.113	29.011
Otisville	C.	29.040	--------	29.133	29.105	[e] 29.109	29.196	[f] 29.006	29.109	[f] 29.084	[f] 29.099	[g] 29.134	[h] 29.171	[i] 29.137	[j] 29.271	[g] 29.178
Battle Creek	S. C.	28.651	28.655	28.611	28.637	28.603	28.644	28.534	28.340	28.585	28.596	28.650	28.683	28.657	28.749	28.656
Kalamazoo	S. C.	29.037	29.099	29.098	29.063	29.058	29.114	28.994	29.075	29.066	29.070	29.119	29.137	29.133	29.216	29.127
Mendon	S. C.	--------	--------	c	--------	--------	--------	--------	--------	[h] 29.087	29.095	[d] 29.140	[e] 29.138	29.142	[f] 29.228	29.125
Tecumseh	S. C.	--------	29.041	28.980	29.001	28.960	29.024	28.897	29.002	28.917	28.956	[d] 28.986	28.986	28.977	29.063	28.989
Detroit	S. E.	29.268	29.348	29.350	29.343	29.311	29.385	29.286	29.323	29.299	29.306	29.365	29.363	29.374	29.473	29.371
Washington	S. E.	--------	29.135	29.250	29.273	29.234	29.301	29.163	29.246	29.217	29.221	29.292	29.275	29.289	29.367	29.247

* The names of observers, their places of observation, and the counties in which these places are situated, are stated in Exhibit 26, page 404.

† The full names of the divisions and the counties in each division are stated in Exhibit 1, page 257.

‡ This line is an average for only the localities from which reports were received for every month of the year.

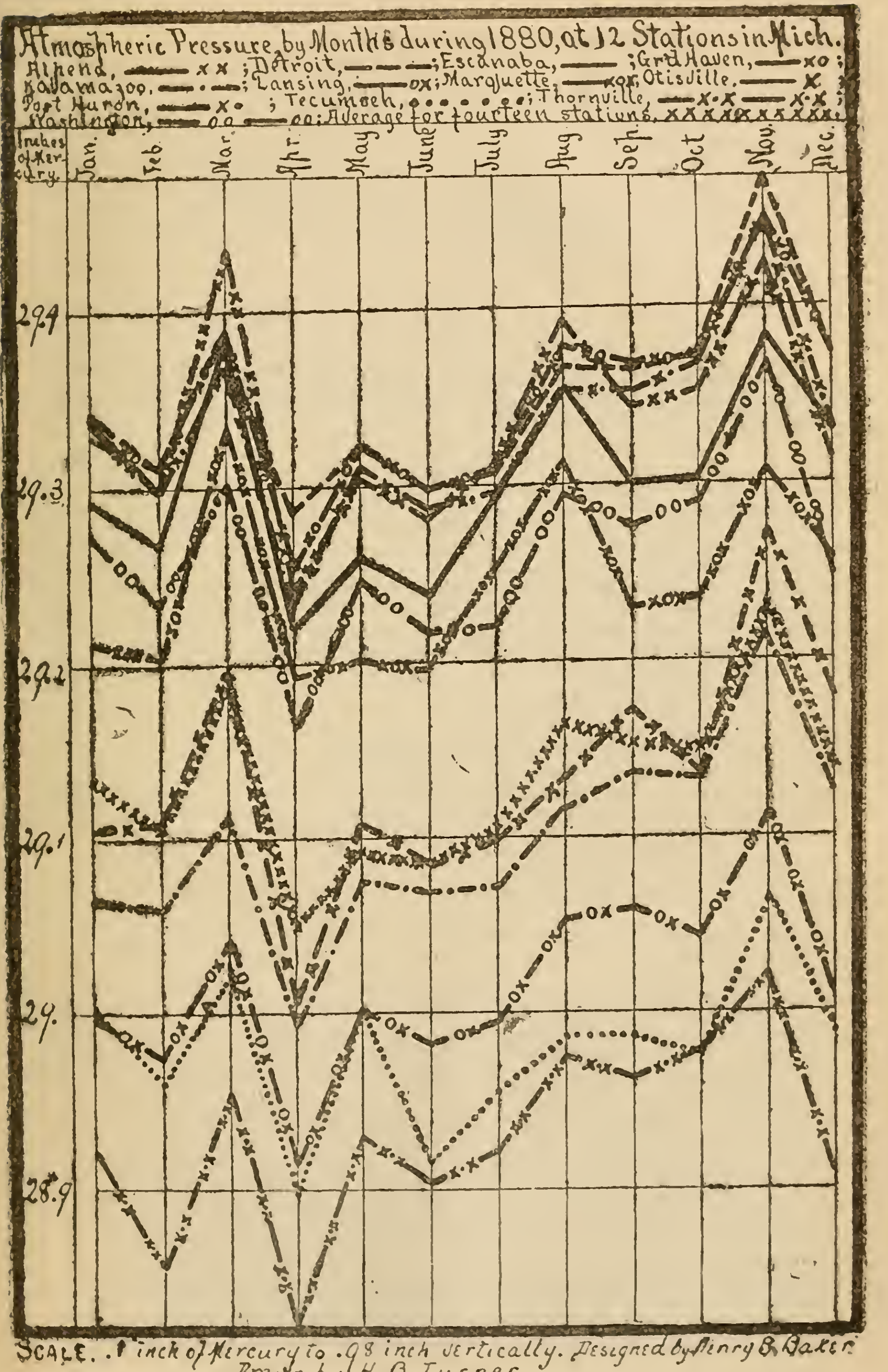
§ For stations marked thus (§) a correction has been made for instrumental error, as follows: For Alpena June 30 to Dec., inclusive, .006 added; for Grand Haven .002 added; for Lansing Jan. to Aug. 9, inclusive, .002 added; for Detroit .017 added; for Washington, .130 added. For other stations the instrumental error of barometer is not known.

‖ The observations compiled in this line were made at Nirvana for 1879, and for the first months of 1880, to and including April 25, 1880. After that date they were made, with the same instrument, at Reed City, about 10 miles distant from Nirvana.

[a] The average for 8 stations in 1878 is 29.108. [b] The average for 13 stations in 1879 is 29.155. [c] For 7 months, 29.139 in. [d] For 30 days. [e] For 28 days. [f] For 29 days. [g] For 25 days. [h] For 23 days. [i] For 24 days. [j] For 26 days.

The lines for 12 stations in this table are graphically represented in Diagram XVIII., page 467, opposite this.

DIAGRAM XVIII.—ATMOSPHERIC PRESSURE, BY MONTHS IN 1880.



Scale. .1 inch of Mercury to .98 inch vertically. Designed by Henry B. Baker.
Drawn by H. B. Turner.

ALPHABETICAL INDEX.

[Localities in Michigan when not otherwise stated. Authors of papers, and not the State Board of Health, are responsible for statements in their papers; hence statements for which the Board is not responsible may appear in the index.]

A.

PAGE.

- Abortion, as a Cause of Death, and Injuries to Health by 165
  - Condemnation of 37
  - Coroners and Coroner's Juries unwilling to Investigate Deaths by 165
  - Criminal, Dr. Kellogg to Prepare a Report on xlii
  - Criminal, Report of Committee on 164-6
  - Criminal, Resolution relative to Obtaining Information in Regard to 166
  - Druggists, Physicians, the Press, and the Clergy, Abettors of 165
  - Indifference of People towards 164-5
  - Knowledge that it is a Crime the Great Means of Preventing 167
  - Need of Moral Education relative to 166-8
  - Rare among Roman Catholics 166, 167
  - 33 Per Cent of Pregnancies Estimated to End in 165
  - Six Thousand Women Die from, in the U. S. Annually 165
- Accidents, Concerning Number and Variety of, (*See Casualties*) 95-6, 101
- Accidents due to use of Crude Coupling-links on freight cars 102
- Adrian, Falling of Grand Stand at, at Lenawee Co. Fair 95, 96, 99
  - Reports of Sickness and Meteorology at, in 1880, Compiled by Months 325, 328-75, 404, 414-64
- Adulteration of Foods and Drugs, Resolution for National Law to Prevent 68
- Ages, Average, of Pupils in Different Grades of a Public School 80
- Ages of Decedents from Diphtheria, Concerning 74
- Agricultural College, near Lansing, Meteorological Conditions at, in 1880, Compiled by Months, 404, 405, 413-50.
- Agriculture, Dependence of Other Industries on 67
- Ague-cures, so-called, Composition of 153
- Ague, *See Intermittent Fever.*
- Air as a Disinfectant, no Substitute for 105
- Air, Foul, Experiments in Removal of, and in Heating xxxv-xxxvi
- Air, concerning Sources and Evils of Impurities of 18-23
- Albion, Reports of Sickness at, in 1880, Compiled by Months 325, 328-75
- Alcohol, Action of, on Vital Functions 126-36
  - a Febrifuge 132
  - as a Food, Prof. Vaughan on 135-6
  - as a Narcotic and a Stimulant 127-134
  - Dr. Kinne on Action of, on Vital Functions 126-34
  - not a true Stimulant 127-134
  - Paralyses the Sympathetic Nerves and power of Self-control 128-134, 135
  - Reduces Bodily Temperature 132
  - the Exhilarating Power of, not proof that it is a Stimulant 130
  - Unchanged in Mixed Beverages 135
- Alcoholism, a Nervous Disease 162
  - The Use of Soothing-syrups and Cordials Productive of 162-3
- Alden, Lyman P., Meteorological Registers from, Compiled by Months 404, 422-64
- Aldrich, Hon. A. L., of Local Committee for Flint Sanitary Convention 4

PAGE.

Algeria, Decrease of Fevers in, by Planting the Eucalyptus globulus 64
Allen, Jno. K., Paper on Personal Sanitary Responsibilities 89, 136–41
  Made an Exhibit of Sanitary Publications at the Flint Convention 70
Allen, M. D., G. B., Weekly Reports of Diseases by, Compiled by Months 324, 327–70
Alpena, Av. Temp. and Av. Night Ozone at, by Months in 1879, Diagrams 115, 120
  Reports of Sickness and of Meteorological Conditions at, in 1880, Compiled by Months, 324, 326–42, 404, 405, 418–67.
Alvord, M. D., A. W., Replies to Circular 40, Diseases in 1880 281–2
  Weekly Reports of Diseases by, Compiled by Months 325, 328–75
American Medical Association (1881), Dr. Lyster Requested to Attend xl
American Public Health Association, Dr. Baker's Report of 1880 Meeting 237–41
American Social Science Association, 1881, Mr. Parker's Report of Public-Health Subjects before, ... xlv., 227–9
Ames, Frank M., on Formation of Glucose in Cane Sugar 247–8
Andrews, M. D., Josiah, Weekly Reports of Diseases by, Compiled by Months 325, 328–75
Animals, Letter relative to Collection of Vital Statistics of, Referred xxxix
  Summary of Replies Concerning Diseases of, in Mich. in 1880 265–6
Annual Reports for 1880 from Health Officers and Clerks of Local Boards, concerning .... ix–xiii
Annual Reports of this Board, Articles in, with Names of Authors 175–8
Ann Arbor, Reports of Sickness at, in 1880, Compiled by Months 325, 328–43
Appropriation for the State Board of Health, relative to Increase of, Resolution ... xxxv, xxxvi, 69
Apple-jelly, Containing Zinc-oxide, Poisoning of a Family by, Analysis .... xxxvi, lviii
Arenac, Bay Co., Concerning Diphtheria at l
Army, U. S., Syphilis in 197
Ash in Sugars and Syrups, Amount of, Removal of, etc. 244–5
Ashton, M. D., B. D., Weekly Reports of Diseases by, Compiled by Months 324, 326–29
Assimilation, Digestion, and Excretion Most Rapid in Forenoon 52
Asylum for Insane, at Kalamazoo, Meteorological Conditions at, in 1880 .... 405, 414–67
Atmospheric Pressure, and Coincident Sickness in Mich., by Months in 1880 380–402
  Av. at 15 Stations in Mich., Year and Months, 1880, Table and Diagram 405, 466–7
  at Stations in Mich. in 1880 and 1879, Compared by Months 465
  Instruments and Directions for Observing 408
Attorney Gen. of Mich., on Necessity for Testing Every Barrel of Illuminating Oil 250
Atwood, J. B., on Ventilation of Sewer-traps 30
  Vice-president, and member of Committee, Flint Sanitary Convention 3, 4, 54
Authors of Papers in this Report Responsible for their Statements in iv
Averill, Perry, Reference to Report by, on Inspection of Illuminating Oils 176
Avery, M. D., John, Member of State Board of Health, Postoffice Address, etc. vii
  Questions at Examination in Sanitary Science in 1881 236

B.

Babbitt, G. W., Meteorological Instruments in care of, Turned over to Capt. Holden xix
Babington, M. D., John, Weekly Reports of Diseases by, Compiled by Months 324, 344–6, 352–62
Bacillus anthracis and bacillus subtilis, Transformation of, in Presence of Oxygen xliv
Backus, M. D., C. W., Replies to Circular 40, Diseases in 1880 284
  Weekly Reports of Diseases by, Compiled by Months 325, 328–75
Bacteria, Communication of Consumption by Inoculation with 143
Bacteria of Charbon, Chicken-cholera, etc., Modification of, in Presence of Oxygen, xliv, 201, 202, 203
Bacteria, Pass through Overlying Earth 29
Badger, M. D., Irus W., Weekly Reports of Diseases by, Compiled by Months 324, 326–74
Bailey, Sergt. W. O., Meteorological Registers from, Compiled by Months 404, 405, 418–467
Baker, M. D., Henry B., Reports by, on Exhibits of Sanitary Appliances at Conventions, ... 16, 69, 188
  Letter on Free Vaccination, Burial of the Dead, Suppression of Nuisances, etc. liii
  of Committee on Sanitary Conventions 4, 88
  of Committee to Devise Plan for Regulation of Practice of Medicine xxxiv
  of Committee to Prepare Tract on Disinfection xli
  of Committee to Revise Document on Resuscitation of Drowned xlii
  Paper on the Systematic Study of Causes of Sickness and Deaths 89, 107–124
  Passed Examination in Sanitary Science xxxv
  Questions at Examination in Sanitary Science in 1881 236
  Reference to Papers by, in Annual Reports of this Board 175–8
  Report on a Seal for the State Board of Health .... lxi–lxii
  Report on Hog Cholera in Southwestern Mich. .... lviii–lx
  Report of New Orleans Meeting of American Public Health Association 237–241

PAGE.
Baker, M. D., Henry B.—*Continued*,—
  Requested to Prepare a Tract on Hospitals for Communicable Diseases.......... xliv
  Resolution on Diagnosis of Epidemic and Contagious Diseases.......... 240
  Resolution to Print Paper by Hon. Erastus Brooks.......... 240
  Resolutions by, to Prevent Importation of Contagious Diseases by Immigrants..........xlii-xliii
  Secretary and Committee of State Board of Health, Postoffice Address, etc.......... vii-viii
  To the Atty. Gen. on Necessity for Testing every Barrel of Illuminating Oil.......... 249-50
  To State Oil Inspector, on Necessity for Testing every Barrel of Illuminating Oil.......... 251
Ballard, Mrs. Stephen H., Reference to Paper by, on Cooking.......... 176
Barnes, Rev. D. F., President of Battle Creek Sanitary Convention, Address by, etc..........87, 88, 93-4
  on Relations of the Clergy and Criminal Abortion.......... 167
Barnyards, Hencoops, Hogpens, etc., Contamination of Air by.......... 21-2
Barwick, Sergt. James A., Meteorological Registers Received from, Compiled by Months, 404, 405, 415-467.
Battle Creek, Av. Night Ozone at, by Months in 1878, Diagram.......... 181
  Av. Temperature at, by Months in 1879, Diagram.......... 115
  Reports of Sickness and Meteorological Conditions at, in 1880, Compiled by Months, 325, 328-59, 405, 418-66.
  Proceedings and Addresses at Sanitary Convention at.......... 85-188
  Proceedings at Meeting of the Board Held at..........xxxviii
  Committees, and Reports by Committees, at Sanitary Convention at..........94-5, 188
  Sanitary Association Formed at.......... xli
Batwell, M. D., Edward, Replies to Circular 40, Diseases in 1880.......... 285-6
  Weekly Reports of Diseases by, Compiled by Months..........325, 337-75
Baumler, C., on the Origin of Syphilis.......... 198
Bavarian Army, No Deaths from Small-pox in, from 1843 to 1857.......... 290
Bay-and-Eastern Division in Mich., Sickness and Meteorological Conditions in, in 1880, 258, 260, 267-8, 275-7, 311, 321, 324, 226-74, 378-9, 418-66.
Bay City, Reports of Deaths and Sickness in, in 1880..........254, 258, 275
Bay City, Reports of Sickness at, in 1880, Compiled by Months..........327, 326-74
Beaconsfield, Lord, on the Importance of Public Health Work.......... 136
Bedding, etc., Disinfection and Care of, in cases of Contagious Diseases, 206, 207-8, 213-14, 215-16, 220, 296, 297-8.
Beebe, M. D., C. V., Weekly Reports of Diseases by, Compiled by Months..........325, 327-67
Beef, Fat and Lean, and Starch, Amount of Heat from Oxidation of.......... 51
Bees, Great Mortality among, in Cass Co. in 1881.......... lxi
Belknap, M. D., Simeon, Replies to Circular 40, Diseases in 1880.......... 280
  Weekly Reports of Diseases by, Compiled by Months..........325, 328-75
Bell, M. D., John, Meteorological instruments intrusted to, Fiscal Year 1881.......... xviii
  Meteorological Registers from, Compiled by Months..........404, 422-464
  on Ozone Observations at a Great Altitude in Colorado.......... 446
Benton Harbor, Av. Night Ozone at, by Months in 1878, Diagram.......... 118
  Meteorological Conditions at, in 1880, Compiled by Months..........404, 422-64
Bernard, on Effects of Dividing the Sympathetic Nerve.......... 130-31
Big Rapids, Reports of Sickness at, in 1880, Compiled by Months..........324, 326-74
Billings, Dr., J. S., on the Obstacles to an Efficient Public Health Service.......... 237-38
  Reference to Remarks by, on Ventilation.......... 178
Biology, General Topics for the Examinations in Sanitary Science.......... 232
Bishop, M. D., M. E., on Diphtheria in South Haven Township.......... 1
Blind, Deaf, and Dumb, in Mich., Proportion of, made so by Preventable Sickness.......... 223
Blissfield, Reports of Sickness at, in 1880, Compiled by Months..........325, 357-75
Board of Health in Detroit, Plan, Bill, and Act for..........54-61, xxxii
  Resolution on Need for.......... 68
Board of Health (City), concerning Qualifications of Members of..........55, 56, 57, 60, 61
Boards of Health in Cities and Villages in Mich., Constitution of..........xiv-xv, 295-6
Boards of Health, Local, Citizens Should Earnestly Support.......... 137-8
  Duties of, in Restriction and Prevention of Contagious Diseases..xliii, xlv, 206, 213, 299, 300, 301-4
  Efficiency of, Has Been Increased by Work of the State Board.......... 172-3
  Must Appoint a Health Officer, and Report his Address to State Board of Health, xiii, xiv-xv, 137
  Must Make Annual and Other Reports to the State Board of Health.......... ix
  Must Give Public Notices of Regulations.......... 302
  Organization, and Duties of..........xiii, xiv-xv, 137
  Should Keep Records of Diseases.......... ix-x
  Should Instruct Health Officer to Act Quick on Outbreak of a Communicable Disease..xlv, 206, 213, 301, 302.

PAGE.
Boies, Lieut. A. H., Meteorological Registers from, Compiled by Months......404, 414-64
Relative to Meteorological instruments intrusted to, Fiscal Year 1881...... xix
Boiler explosions, concerning Mr. Lawson's Theory of...... xli
Boilers, Unsafe, Used in Steamboats on Inland Lakes...... xliv
Books, etc., Loaned from Library of the Board, Sept. 30, 1881......xxvii-xxix
Purchased by the Board, Fiscal Year 1881......xix-xx
Received Fiscal Year 1881, Alphabetical List of Donors......xx-xxvii
Bowel Diseases, Deaths from, in Mich. for each of the Years 1869-1877, Diagram...... 111
Bowels, Inflammation of, Av. Order of Prevalence, Where and When Present, Year and Months, 1880......314-9, 326-73, 379
Comparative Amount of Sickness in Mich. in 1880 Caused by......262-3, 312-13, 401
Diagram, Per Cent of Weekly Reports of, by Months in 1880...... 401
No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880...... 262-3
Per Cent of Observers Reporting, by Months and Year 1880......312-9, 379
Per Cent of Weekly Reports of, State and Divisions, Year and Months, 1880......314-23, 379, 401
Per Cent of Weeks Present Where Present, Year and Months in 1880......314-19, 379
Times Reported Usually or More or Less than Usually Severe in 1880...... 314-19
Bradfield, M. D., T. D., Replies to Circular 40, Diseases in 1880...... 273
Bradley, M. D., Judson, Replies to Circular 40, Diseases in 1880...... 286
Weekly Reports of Diseases by, Compiled by Months......325, 341-75
Brain, Inflammation of, Av. Order of Prevalence Where and When Present, Year and Months, 1880......314-9, 326-73, 379
Comparative Amount of Sickness in Michigan in 1880 Caused by......312-3, 390
Diagram, Per Cent of Weekly Reports of, by Months in 1880...... 390
Per Cent of Observers Reporting, by Months and Year, 1880......312-19, 379
Per Cent of Weekly Reports of, State and Divisions, Year and Months, 1880......314-23, 379, 390
Per Cent of Weeks Present Where Present, Year and Months in 1880......314-19, 326-73, 379
Times Reported Usually or More or Less than Usually Severe in 1880...... 314-9
Brain Diseases, Deaths from, in Mich., for each of the Years 1869-1877, Diagram...... 111
Breakfast, Stimulants Unsuitable for, What Foods Suitable for...... 53
Breedon, Jacob, Meteorological Registers from, Compiled by Months......404, 414-64
Briggs, M. D., Thos. H., Weekly reports of Diseases by, Compiled by Months......325, 328-67
Brigham, Rev. Charles H., Reference to Papers by, in Annual Reports of this Board...... 177
Brockway Center, Reports of Deaths and Sickness in, in 1880......254, 258, 275
Brodie, M. D., Wm., Reference to Address by, as President of Sanitary Convention, Detroit. 177
Bronchitis, Av. Order of Prevalence Where and When Present, Year and Months, 1880...... 314-19, 326-73, 377-9, 381.
Comparative Amount of Sickness in Michigan in 1880 Caused by......262-3, 308, 312-13, 377-8
Diagram, Per Cent of Weekly Reports of, by Months in 1880...... 308
Diagram, Per Cent of Weekly Reports Stating Presence of, in Mich. by Months in 1879.. 121
Diagram, Per Cent of Weekly Reports Stating Presence of, in Mich. by Months in 1878.. 119
No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880...... 262-3
Per Cent of Observers Reporting, by Months and Year, 1880......312-19, 379
Per Cent of Weekly Reports of, State and Divisions, Year and Months, 1880..308, 314-23, 377-9, 381
Per Cent of Weeks Present Where Present, Year and Months in 1880......314-19, 326-73, 379
Relations of, to Meteorological Conditions, by Months in 1880...... 381, 402
Times Reported Usually or More or Less than Usually Severe in 1880...... 314-19
Brooklyn, Reports of Sickness at, in 1880, Compiled by Months......325, 328-75
Brooks, Hon. Erastus, Paper by, on What the State Owes the People, Ordered Printed...... 240
Browne, M. D., H. W., Weekly Reports of Diseases by, Compiled by Months......325, 327-71
Bruce, M. D., Almon G., Weekly Reports of Diseases by, Compiled by Months......324, 327-34, 368-70
Brussells, Prevention of Small-pox in, by Vaccination...... 290
Buckham, M. D., T. R., of Committee on Resolutions, Report by......16, 69-70
Condemns Public Funerals of Decedents from Contagious Diseases...... 25
Budd, Dr., on Character and Causation of Tuberculosis...... 147-148
Bunkerhill, Ingham Co., Special Reports concerning Diphtheria at......xlv-xlvi
Burial of Decedents from Contagious Diseases, concerning......25, 206, 207, 213, 215, 298, 302
Butter, concerning Adulteration of...... 47
Button, German, on Diphtheria in Echo township, Antrim Co...... xlix-l

C.

Cadillac, Reports of Sickness at, in 1880, Compiled by Months......324, 326-74
Calkins, M. D., H. T., Replies to Circular 40, Diseases in 1880...... 274
Campbell, M. D., O. B., Weekly Reports of Diseases by, Compiled by Months......325, 327-75

PAGE.
Cane Sugar, Pure, Concerning Glucose in ... 242, 244-6, 247
Canker Rash, Rash Fever, Scarlet Rash, Scarlatina, Names for Scarlet Fever ... 211
"Canned Meat" Sometimes prepared from Bruised Meat ... 68
Carbonic Acid, Exhalation of, When Greatest ... 52
Carlton, M. D., Wellington, Weekly Reports of Diseases by, Compiled by Months ... 325, 328-75
Casnovia, Reports of Sickness at, in 1880, Compiled by Months ... 324, 364-70
Cassopolis, concerning Hog Cholera and Winter Cholera at, in 1881 ... lxi
  Reports of Sickness at, in 1880, Compiled by Months ... 325, 328-39
Casualties, a Large Proportion of, but not All, Preventable ... 96-7, 98, 99
  by Rail, concerning Use of Pilot Engines to Prevent ... 98
  by Rail, Provisions of Law against, in Michigan ... 100
  concerning Legal and other Measures for Prevention of ... 95-104
  concerning Number and Variety of ... 95-6, 101
  concerning Payment of Damages for Injuries by ... 98, 99
  Liability of Persons and Corporations for, Defined ... 99
  Messrs. Hauxhurst, Fairbank, Kingman, Jacokes, and Hitchcock, on Prevention of ... 103-4
  More Frequent where no Preventive Laws are in Force ... 101
  on July 4, Largely Preventable ... 101
  Provisions of Law against, How Far Complied with ... 100-101
  Self-interest Prompts Railroads, etc., to Guard Against ... 98
  Those who cause through neglect should be punished as Criminals ... 101
Catholic Clergy, Influence of, in Prevention of Abortions ... 166, 167
Cattle Commissioners, State Board of, Held First Meeting in Office of State Board of Health xxxiv
Caulkins, M. D., John S., Committee on Ventilating Apparatus, Report by ... 16, 69
  Meteorological Registers from, Compiled by Months ... 404, 405, 414-467
  Paper on Forests and Trees as Sanitary Factors ... 5, 61-8
  Reference to Paper by, on Methods of Study in Sanitary Science ... 177
  Replies to Circular 40, Diseases in 1880 ... 275-77
  Weekly Reports of Diseases by, Compiled by Months ... 324, 327-74
Cedar River, October Temperature of, 1874-80 ... 416
Cedar Springs, Reports of Sickness at, in 1880, Compiled by Months ... 324, 326-74
Cellars as Means of Contaminating the Air of Living-rooms ... 20
Centerville. Reports of Sickness at, in 1880, Compiled by Months ... 325, 328-75
Central Division in Mich. Relative to Meteorological Conditions and sickness in ... 258, 260, 267-8
  277-80, 311, 322-3, 324-5, 326-75, 378-9, 418-66.
Central Mine, Reports of Sickness at, in 1880, Compiled by Months ... 324, 326-74, liv
Cereals, Fruits, Potatoes, etc., Summary of Replies concerning Diseases of, in 1880 ... 266, 270
Cerebro-spinal Meningitis, a Preventable Disease ... 222
  Av. Order of Prevalence Where and When Present, Year and Months, 1880 ... 314-19, 326-73, 379
  Comparative amount of Sickness in Michigan in 1880 Caused by ... 262-3, 312-13 400
  Concerning an Outbreak of, at Jackson, Mich. ... lv—lvi
  Per cent of Observers Reporting, by Months and Year, 1880 ... 312-19, 379
  Diagram, Per Cent of Weekly Reports of, by Months in 1880 ... 400
  Diagram, Per Cent of Peports stating Presence of, in Michigan, by Months in 1879 ... 113
  No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880 ... 262-3
  Per Cent of Weekly Reports of, State and Divisions, Year and Months in 1880 ... 314-23, 379, 400
  Per Cent of Weeks Present Where Present, Year and Months in 1880 ... 314-19, 326-73, 379
  Summary of Replies concerning No. of cases of, in Mich., in 1880 ... 264
  Times Reported Usually or More or Less than Usually Severe in 1880 ... 314-19
Cerebro-spinal and Sympathetic Nerves, Physiology of, ... 128, 129
Chancellor, Dr., Resolutions by, for Legislation to Restrict Contagious Diseases ... 239
Charbon, Germs of, Live in the Ground Many Years ... 203-4
  Preventive Inoculation for ... 202
Charbon Virus, etc., Attenuation, Intensification, and Preservation of ... 201-204
  Effects of the Air on ... xliv, 201-2
Charlotte, Reports of Sickness at, in 1880, Compiled by Months ... 324, 327-70
Charitable Institutions of Michigan, relation of, to Preventable Sickness ... 222-4
Chase, M. D., E. V., Weekly reports of Diseases by, Compiled by Months ... 324, 327-74
Chase, Hon. Zach., Mayor of Flint, Welcoming Address at Sanitary Convention ... 4, 5-6
Chase, M. D., Milton, on Compensating Conditions in the Causation of Sickness ... 88, 104-7
  Replies to Circular 40, Diseases in 1880 ... 280-1
  Weekly reports of Diseases by, Compiled by Months ... 325, 328-75
Cheboygan, Diphtheria and Small-pox at, and Prosecution for failure to Report Diphtheria li
Cheese, concerning Adulteration of ... 47

PAGE.
Chemist to a City Board of Health, concerning Duties of 60
Chicken-cholera, concerning Modification of Microbes of 201, 202, 203
Children, Great Mortality among, Preventable 7-9
  Importance of Right Nurture of 35-6
  most Susceptible to Diphtheria, Scarlet Fever, etc. 209, 217
  the Opium-habit formed in, by Use of Soothing-syrups, cordials, etc 160-2
Cholera Infantum, Av. Order of Prevalence Where and When Present, Year and Months in 1880 .... 314-9, 326-73, 379, 397
  Comparative Amount of Sickness in Michigan in 1880, Caused by 262-3, 312-13, 382
  Diagram, Per cent of Weekly Reports of, by Months in 1880 382
  Diagram, Per cent of Weekly Reports Stating Presence of, in Mich., by Months in 1879 121
  Diagram, Per cent of Weekly Reports Stating Presence of, in Mich., by Months in 1878 119
  No. of Correspondents Reporting in Reply to Circular 40, by Months in 1880 262-3
  Per cent of Observers Reporting by Months and Year in 1880 .... 312-19, 379
  Per cent of Weekly Reports of, State and Divisions, Year and Months, 1880 .... 314-23, 379, 382, 397
  Per cent of Weeks Present Where Present, Year and Months in 1880 .... 314-19, 326-73, 379
  Relations of, to Meteorological Conditions, by Months in 1880 .... 397, 402
  Times Reported Usually or More or Less than Usually Severe in 1880 314-19
Cholera in the Hog, See Hog Cholera.
Cholera Morbus, Av. Order of Prevalence Where and When Present, Year and Months in 1880 .... 314-19, 326-73, 377-9
  Comparative Amount of Sickness in Michigan in 1880, Caused by 262-3, 308, 312-3, 377-8
  Diagram, Per Cent of Weekly Reports of, by Months in 1880 308
  Diagram, Per cent of Weekly Reports Stating Presence of, in Mich. by Months in 1879 121
  Diagram, Per cent of Weekly Reports Stating Presence of, in Mich. by Months in 1878 119
  No. of Correspondents Reporting in Reply to Circular 40, by Months in 1880 262-3
  Per cent of Observers Reporting, by Months and Year in 1880 .... 312-19, 379
  Per cent of Weekly Reports of, State and Divisions, Year and Months, 1880 .... 308, 314-23, 379
  Per cent of Weeks Present Where Present, Year and Months in 1880 .... 314-19, 326-73, 379
  Times Reported Usually or More or Less than Usually Severe in 1880 314-19
Cholera, One case Reported in Mich. in 1880 .... 262, 273
  in Zullunder, India, Great Diminution of, by Sanitary Measures 12-13
Christian, M. D., E. P., Replies to Circular 40, Diseases in 1880 287-8
  Weekly reports of Diseases by, Compiled by Months 325, 328-75
Christianity Has Great Regard for the Human Body 32-5
Christianity and Sanitation, Rev. Chas. H. W. Stocking on 31-8
Churches, Schools, Theaters, etc., concerning Inspection for Safety of, in Mich. 100
Circular 40, Inquiries concerning Diseases in Michigan in 1880 253-72
Circular 41, Demanding Report for 1880 from Health Officers .... ix-xii
Circular 43, Demanding Return of Address of City and Village Health Officers .... xiv-xv
Circular 44, Demanding Return of Address of Township Health Officers for 1881 xiii
Circulation of the blood, Concerning the Influence of Alcohol on 130-132, 135
Citizens Responsible for Efficiency of Local Boards of Health 137-8
City Board of Health, Plan for 54-61
  Constitution of, in Mich .... xiv-xv, 295-6
Claflin, M. D., N. H., Replies to Circular 40, Diseases in 1880 284-5
  Weekly Reports of Diseases by, Compiled by Months 325, 328-75
Clark, Mrs. E., on Intemperance as A Cause of Destruction of Human Life 4, 30-31
Clark, M. D., Daniel, Paper on sewerage and Its Adjuncts 4, 26-9
Clapp, M. D., H. C., Replies to Circular 40, Diseases in 1880 283-4
  Weekly reports of Diseases by, Compiled by Months 325, 328-75
Cleanliness, Pure Water, Air, Food, etc., Importance of 10-15, 17-25
Clement's dry Safe-waste trap, Recommendation of 188
Clergy, The, Aid Abortion by Not Giving Proper Instruction 165
Clerks of Local Boards of Health, concerning Annual Reports from, for 1880 .... xii-xiii
Cleveland, M. D., B. L., Weekly reports of Diseases by, Compiled by Months 324, 352-74
Climate, concerning Influence of Forests on 67
Climatic Conditions, Uses of Knowledge Concerning 114, 117, 122, 124
Climatic Diseases May be Controlled or Avoided 124
Climax, Calhoun Co., Report on Hog Cholera at .... lviii-lx
Clinton, Reports of Deaths and Sickness in, in 1880 .... 254, 258, 260, 281-2
  Reports of Sickness at, in 1880, Compiled by Months 262-3, 282, 325, 328-75
Clio, Inactivity of Board of Health with regard to Diphtheria in .... xlvi-xlvii
Clothing, Badly Disinfected, Communication of Small-pox by .... xl-xli

PAGE.

Clothing, etc , Disinfection and Care of, in cases of Contagious Diseases..206, 207-8, 213-14, 215-16, 220, 296, 297-8.
Cloudiness, Av. Per cent at 23 Stations in Mich., by Months in 1880, Table and Diagram...... 436-7
  Av. Per cent of, at Stations in Mich. in 1879 and 1880, Compared by Years and Months.... 435
  Av. Per Cent, at Thornville by Months in 1880...... 276, 437
  Directions for Observing and recording...... 408
Cobb, Lee S., Meteorological instruments intrusted to, Fiscal Year 1881...... xviii
  Meteorological Registers Received from, Compiled by Months......404, 414-466
  On Sickness at Nirvana in 1880...... 331, 335
Coffee and Tea not Suitable for Breakfast...... 53
Cogshall, M. D,, Bela, Paper on Contagiousness of Consumption......89, 142-51
  Report by, as Secretary of Flint Sanitary Convention...... 3-83
  Of Local Committee for Flint Sanitary Convention...... 4
Cohnheim, Experiments by, in Inoculation of Tuberculosis...... 145-6
Cold, Dry Air Favorable to spread of Diphtheria, Scarlet Fever, etc...... 209,217
Coldwater, Av. Night Ozone at, by Months in 1878, Diagram...... 118
  Invitation to Hold Sanitary Convention at......xxxvii, xxxix
  Reports of Sickness at, in 1880, Compiled by Months......325, 328-43, 353-75
Cold weather Diseases, Relations of, to Meteorological Conditions......114, 117-22, 124
Color-blindness, all Railroad Employees should be examined for...... 102
Committees at Battle Creek Sanitary Convention, Reports by...... 188
Committees at Flint Sanitary Convention, Reports by...... 69-70
Committees of Sanitary Conventions at Flint and Battle Creek......16, 69-70, 94-5, 188
Committees of this Board, Communications referred to...... lxii
Committees (Standing) of the State Board of Health...... viii
Common Council of Detroit, Relations of, to Board of Health...... 61
Communicable Diseases, See "Contagious Diseases," and "Diseases Dangerous to Public Health."
Communications Referred to Committees of this Board...... lxii
Compilation of Reports to the State Board of Health, concerning......xvi, xvii,306-10, 315, 329, 411
Compensation of Health Officials, Smallness of, a Hindrance to Public Health Work...... 238
Connor, M. D., Leartus, Weekly reports of Diseases by, Compiled by Months......325,328-31
Conover, Rev. J. F., Reference to Paper by, on Relation of the Clergy to Sanitary Reform.. 177
Consumption, Pulmonary, and Syphilis, Resemblances between...... 146
  Av. Order of Prevalence Where and When Present, Year and Months, 1880..314-19, 326-73, 377-9, 394
  Comparative Amount of Sickness in Michigan in 1880, Caused by......262-3, 312-13, 377-8, 390
  Diagram, Per Cent of Weekly Reports of, by Months in 1880...... 390
  Common among Cattle and Communicated by Them to Man...... 24
  Communicable from Man to Animals, and from Animals to Man......24, 110, 112
  Communicated by Inhalation of matter from Lungs of Phthisical Patients...... 144-5
  Communication of, to ten Children, by a Nurse...... 145
  Communication of, by Milk...... 149-50
  Communication of, by Diseased Meat...... 148-9
  Dr. Cogshall on Contagiousness and Prevention of...... 142-51
  Over 1,400 Deaths from, Reported in Mich. Annually...... 110
  How to Prevent It...... 148
  Need for Action of Government to Restrict and Prevent...... 150-151
  Need for Special Investigation of...... 124
  No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880...... 262-3
  Per cent of Observers Reporting by Months and Year in 1880......312-19, 379
  Per cent of Weekly Reports of, State and Divisions, Year and Months, 1880...314-23, 377-9, 390, 394
  Per cent of Weeks Present Where Present, Year and Months, 1880......314-19, 326-73, 379
  Proportion of Persons Dying of......110, 112, 142
  Relations of, to Meteorological Conditions, by Months in 1880...... 394, 402
  Testimony to Communicability of......143-8, 149
  Times Reported Usually or More or Less than Usually Severe in 1880...... 314-19
  Twelve per cent of Deaths in Mich. are from...... 112
Contagious Diseases, Attempts to Control in Japan by Enchantments...... 169-70
  Bill to Exclude from Public Schools...... 230-1
  Care of Convalescents from......207, 214-15, 299
  Care of Indigent Patients from, a County Charge......xli, 300, 301
  Difficulties in Enforcing Law Requiring Notices of...... 181-4
  Documents on Prevention and Restriction of......205-220, 289-304
  Duties of Boards of Health in Preventing and Restricting......xliii, xlv, 206, 213, 299, 300, 301-4

PAGE.

Contagious Diseases,— *Continued*,—
  Directions for Disinfection in Cases of 206-8, 214-16, 220, 297-8
  How to Control 123
  Lack of Ventilation Intensifies 67
  Laws of Mich. for Prevention and Restriction of 205, 206, 212, 213, 295-6, 299, 300, 301, 302, 303-4
  Legislation Urged Making it a Crime Knowingly to Communicate 239
  Mitigation of, by Cultivation of Virus .... xliv, 201-3
  Proposed Amendment to Law Concerning, Referred to Mr. Parker xlii
  Public Funerals should not be held for Decedents from 207, 215, 220, 298
  Public Funerals of Decedents from, Illegal in New York 8
  Public Safety Should Have Benefit of Doubt in Diagnosis of 240
  Resolutions to Prevent Importation of, by Immigrants .... xlii-xliii
  Restriction of, in Jails and Poorhouses 304
  See "Diphtheria, Scarlet Fever, Small-pox, etc."
  See "Diseases Dangerous to the Public Health."
Conventions, Sanitary, See *Sanitary Conventions.*
Cooking, Good, Importance of 36-7
Cooking-vessels of Galvanized Iron, Danger of Zinc-poisoning by .... xxxvi, lviii
Copperas, Use of, as a Disinfectant, in Cases of Contagious Diseases 206, 207, 214, 297
Corbett, Rev. Dr. Sidney, Vice-president Battle Creek Sanitary Convention 87
Corbin, M. D., G. E., Reference to Paper by, on Unsanitary Conditions of Public Schools 177
  Replies to Circular 40, Diseases in 1880 279
Corn Sugars and Syrups, Cane Sugars, etc., Analyses of, by Prof. S. P. Sharples .... xxxvi, 242-8
Corunna, Reports of Sickness at, in 1880, Compiled by Months 324, 327-34, 341-6, 352-62, 368-70
Cosmetics, Harmful Substances in 156
Cottages, More Sickness in, than in High Tenements, in Detroit xliv
Cox, Dr. Edward, on the Relation of the Clergy to Criminal Abortion 167
  Report by, on Criminal Abortion 164-6
  Vice-president Battle Creek Sanitary Convention 87
Craig, C. E., W. F., Reference to Paper by, on Sewerage System of Detroit 177
Cressy, Dr., on Communication of Consumption by Meat 149
Criminal Abortion, See Abortion.
Crosby, M. D., Amos, on Evil Effects of Nostrums on Children 89, 160-163
  Weekly reports of Diseases by, Compiled by Months 325, 337-75
Croup, Membranous, Av. Order of Prevalence Where and When Present, Year and Months, 1880 .... 314-19, 326-73, 379, 384
  Comparative Amount of Sickness in Michigan in 1880, Caused by 262-3, 312-3, 382
  Diagram, Per cent of Weekly Reports of, by Months in 1880 382
  No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880 262-3
  Per cent of Observers Reporting, by Months and Year, 1880 .... 312-19, 379
  Per cent of Weekly Reports of, State and Divisions, Year and Months, 1880 .... 314-23, 379, 382, 385
  Per cent of Weeks Present Where Present, Year and Months, 1880 .... 314-19, 326-73, 379
  Relations of, to Meteorological Conditions, by Months in 1880 .... 384, 402
  Times Reported Usually or More or Less than Usually Severe in 1880 314-19
Cudell's Sewer-gas and Back-water trap, Recommendation of 188
Cullen, William, on Properties of Alcohol 127

D.

Damages, concerning Payment of, for Accidental Injuries 98, 99
Day, A. A., Reference to Report by, on Illuminating Oils 176
Dayton, Reports of Sickness at, in 1880, Compiled by Months 325, 328-75
Deaf, Dumb, and Blind in Mich., Proportion of, Made so by Preventable Sickness 223
Deaf and Dumb, Flint Sanitary Convention Visited Institute for 53-4
Deaf and Dumb, Report on Diphtheria in Institute for .... xlviii, 71-4
Dean, Orrin, Jr., Meteorological instruments intrusted to, Fiscal Year 1881 xix
Deaths and Death-rate, Estimated, at Localities in Mich. in 1877-80 .... 253-5, 256
Deaths and Diseases, Need for Uniform and Complete Registration of 238, 107-14
Deaths in Mich. from five Groups of Causes for each of the Years 1869-77 111
Deaths, Preventable, hundreds occur in Mich. every Year 108
Deaths, What Knowledge Needed for Prevention of 108-9
Death-rate as Influenced by Age, Climate, etc., Dr. Baker Committee on viii
Delaware Mine, Reports of Deaths and Sickness in, in 1880 .... 254, 258, 260, 273
Delhi, India, Water-Supply and Sickness at 13-14
DeMuth, M. D., Clark, on Sickness at Plymouth in 1880 343
Denver, Newaygo Co., Report on Diphtheria at .... xlvii-xlviii

PAGE.

- Depth of Water in Wells in Mich. in 1880, Summary of Replies concerning 268-9, 414-5
- Derby, Lord, on Need of Popular Interest in Public Health Work 138
- Detroit, Av. Temperature at, by Months in 1879, Diagrams 115
  - Bill, for a Board of Health in, Plan, Resolution, and Act 54-61, 68
  - Checking of Small-Pox by Vaccination in xliv
  - Reports of Sickness and Meteorological Conditions at, in 1880 ..... 255, 262-3, 286, 325, 328-75, 404, 405, 418-67
- DeWitt, Reports of Deaths and Sickness in, in 1880 ..... 254, 258, 260, 277
- DeWitt, Reports of Sickness at, in 1880, Compiled by Months 277, 262-3, 324, 327-74
- Dew Point at the Agricultural College in 1880 and Previous Years, Compared by Months 427, 428
- Dextrose, Hydrochloric Acid Changes Cane Sugar to 244
- Diagrams, Deaths in Mich., by Groups of Causes, 1869-1877 111
  - Deaths from Pneumonia, by Months, in 1871-4 116
  - Diseases in Mich., Per Cent of Reports, by Months in 1880 ..... 308, 382, 390, 400-1
  - Diseases in Mich., Per Cent of Reports, by Months in 1878 and 1879 ..... 113, 119, 121
  - Meteorological Conditions in Mich., by Months in 1880 419-467
  - Meteorological Conditions in Mich., by Months in 1878 and 1879 ..... 115, 118, 120
  - Diphtheria in Fredericville in May and June, 1881 lvii
- Diagrams Relating to Sickness, Deaths, and Meteorology in Mich., Comments on 117-22, 411
- Diarrhea, Av. Order of Prevalence Where and When Present, Year and Months, 1880, 314-19, 326-73, 377-9, 396.
  - Comparative Amount of Sickness in Michigan in 1880, Caused by, ... 262-3, 308, 312-3, 377-8
  - Diagram, Per Cent of Weekly Reports of, by Months in 1880 308
  - Diagram, Per Cent of Weekly Reports stating Presence of, in Mich., by Months in 1878 119
  - Diagram, Per Cent of Weekly Reports stating Presence of, in Mich., by Months in 1879 121
  - No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880, ... 262-3
  - Per Cent of Observers Reporting, by Months and Year, 1880 ..... 312-19, 379
  - Per Cent of Weekly Reports of, State and Divisions, Year and Months, 1880, ... 308, 314-23, 377-9, 396
  - Per Cent of Weeks Present Where Present, Year and Months, 1880, ... 314-19, 326-73, 379
  - Relations of, to Meteorological Conditions, by Months 122, 396, 402
  - Times Reported usually or More or Less than usually Severe in 1880, ... 314-19
- Digestion, Assimilation, and Excretion Most Rapid in Forenoon 52
- Dill, Sergt. Charles, Meteorological Registers Received from, Compiled by Months 404, 405, 414-67
- Diphtheria, a Preventable Disease 92
  - Av. Order of Prevalence Where and When Present, Year and Months, 1880, 314-19, 326-73, 377-9, 386.
  - Comparative Amount of Sickness in Michigan in 1880, Caused by, ... 262-3, 312-13, 377-8, 382
  - Diagram, Per Cent of Weekly Reports of, by Months in 1880, ... 382
  - No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880, ... 262-3
  - Per Cent of Observers Reporting, by Months and Year in 1880, ... 312-19, 379
  - Per Cent of Weekly Reports of, State and Divisions, Year and Months, 1880, ... 314-23, 377-9, 382, 386
  - Per Cent of Weeks Present Where Present, Year and Months 1880 ..... 314-19, 326-73, 379
  - Relations of, to Meteorological Conditions, Months, in 1880 ..... 386, 402
  - Relative Prevalence in Mich., in 1880 and Previous Years, Summary 256-61
  - Document on Restriction and Prevention of 205-10
  - Fine Imposed for Not Reporting, at Ludington lii
  - Great Mortality of Children from, Preventable 7-9
  - Instance of Gross Concealment of 8
  - National Board of Health Requested to Continue Investigation of 240
  - Need for Special Investigation of 123, 240
  - Resolutions of Am. Pub. H. Assn. relative to Isolation, Diagnosis, and Investigation of Causes 240
  - Spread of, in South Haven Township, because of a Disbelief in its Contagiousness l
  - Successful Restriction of, in Bunkerhill township, Ingham Co. 172-3
  - Special Reports, Communications, etc., Relative to, at or near:—
    - Arenac, Bay Co., Reported by Thos. R. Palmer l
    - Bunkerhill, Tp., Ingham Co., Reported by James Wheaton, Wm. H. Howlett, and Henry Stowel ..... xlv-xlvi, 172-3
    - Central Lake, Antrim Co., Reported by German Button ..... xlix-l
    - Cheboygan, Cheboygan Co., Reported by J. P. Sutton li
    - Clio, Genesee Co., Reported by S. C. Rico xlvii
    - Denver Tp., Newaygo Co., Reported by Dr. L. S. Weaver ..... xlvii-xlviii
    - Echo Tp., Antrim Co., Reported by German Button l
    - Flint, Genesee Co., by Thos. McIntire, H. C. Fairbank, M. D., and Dr. D. Clark ..... xlviii-xlix, 71-4
    - Fort Gratiot, St. Clair Co., Reported by A. A. Whitney, M. D. 374

PAGE.

Diphtheria, Special Reports, Communications, etc.,—*Continued*,—
    Frederic Tp., Crawford Co., Reported by J. F. Hull and J. W. Hauxhurst, M. D. ...... lvi-lvii
    Fremont Center, Newaygo Co., Reported by G. W. Nafe l
    Hastings Tp., Barry Co., Reported by Wm. H. Merrick l
    Hesperia, Oceana Co., Reported by Dr. H. C. Hawley and Dr. L. S. Weaver xlvii
    Ludington, Mason Co., Reported by A. P. McConnell, M. D. lii
    Manchester, Washtenaw Co., Reported by A. C. Taylor, M. D. lv
    Newfield Tp., Oceana Co., Reported by Dr. H. C. Hawley xlvii
    Porter Tp., Midland Co., Reported by Robert Potter ...... liv-lv
    Reed City, Osceola Co., Reported by E. S. Richardson, M. D. ...... xlix, li, 371, 375
    Saginaw City, Reported by N. D. Lee, M. D. 329, 370, 374
    Sheridan Tp., Mecosta Co., Reported by John A. Markle liv
    South Haven Tp., Van Buren Co., Reported by M. E. Bishop, M. D. l
    West Bay City, Reported by J. W. Hauxhurst, M. D. 330
    Wyandotte, Reported by E. P. Christian, M. D. 363
  Summary of Replies concerning No. of Cases of, and Communication of, in Mich. in 1880. 264, 271
  Times Reported Usually or More or Less than Usually Severe in 1880 314-19
  Animals as a Means of Conveying Contagium of 209
  Cases of Communication of, at Reed City li
  Communication of, by Milk, in London 14
  Concerning Ages of Decedents from 74
  Deaths from, in Dark, Unhealthful Dwellings 60
  Difficulty in Proving Contagiousness of, to a Jury 181-3
Diphtheria and Scarlet Fever, Children Most Susceptible to 209, 217
  Price of Documents on Prevention and Restriction of 210, 218
  Special Directions for Avoidance of 209-10, 217-8, 219-20
  Virus of, May Live a Long Time 209, 211
DIPHTHERIA, SCARLET FEVER, SMALL-POX, ETC.,—
  Bill to Exclude from Public Schools 230-31
  Care of Corpse of One Dying from 207, 213, 214, 215, 220, 298, 302
    Health Officer Should Regulate Funerals of Decedents 206, 213, 302
    Public Funerals Should not be held for Decedents 207, 215, 220, 298
  Care of Discharges from Those Sick with 206-7, 211, 214, 216, 219, 220, 297
  Care of Rooms in Sickness from 206, 207-8, 213, 214, 215-6, 220, 297-300
  Care of Indigent Patients from, a County Charge ...... xli, 300, 301
  Certificates of Recovery should be given by the Health Officer 206, 213, 302
  Directions for Disinfection in Case of 206-8, 214-16, 220, 296, 297-8
    Often Best to Burn Infected Material 206, 208, 214, 215, 216, 220, 297
  Documents on Prevention and Restriction of 205-20, 289-304
    Documents Ordered Translated into German and Dutch xl
    Local Boards of Health Recommended to Distribute Documents ...... l, 210, 218, 304
  Duties of Health Officers and Boards of Health in Regard to..xliii, xlv, 206, 212-13, 218, 299, 301-4
  Householders and Physicians must Notify Health Officer of, under Penalty 205, 212, 295
  How to Control 123
  In Jails and Poorhouses, Restriction of 304
  Laws for Prevention and Restriction of 205, 206, 212, 213, 295-6, 299-304
  Notices Should be Placed on Houses where there is 205, 206, 212, 213, 296, 301, 302
  Persons sick with, Exposed to, or Recovering from, should be Isolated..205, 206, 207, 211, 212, 213, 214-5, 219, 220, 296, 299, 300, 301, 302, 303, 304.
  Public Safety Should Have Benefit of Doubt in Diagnosis of 240
  Removal of Persons Sick or infected with 206, 209, 300, 303, 304
Diseases, Abstracts from Replies Relative to Causation, Spread, and Prevention of 271-2
Diseases and Coincident Meteorological Conditions in Mich., by Months in 1880 ...... 380-402, 427
Diseases and Deaths, Need for Uniform and Complete Registration of 238, 107-14
Disease, Cause of, not always limited to one Condition 105
Diseases, Climatic, May be Controlled or Avoided 124
  Contagious, See "Contagious Diseases," "Diseases Dangerous to Public Health," "Diphtheria, Scarlet Fever, Small-pox," etc.
Diseases Dangerous to the Public Health, Difficulty in Enforcing Law Requiring Notices of 181-4
  Boards of Health May Provide Nurses and Supplies to Those Restrained for 300-301
  Boards of Health Must Make Provision for Prevention and Restriction of 206, 212-3, 299-304
  Care of Indigent Patients from, a County Charge ...... xli, 300, 301
  Documents on the Prevention and Restriction of 205-220, 289-304
  Duties of Boards of Health and Health Officers in Relation to ...... xliii, xlv, 206, 212-13, 218, 299-304

PAGE.

- Diseases Dangerous to the Public Health,—*Continued*,—
  - Health Officers Should Verify Diagnosis of.......206, 213, 302
  - Householders and Physicians Must Notify Health Officer or Board of Health of.......205, 212, 295
  - Laws for Prevention and Restriction of.......205, 206, 212-13, 295-6, 299-304
  - Local Boards of Health Must Report concerning, to the State Board of Health.......ix-x
  - Often Most Prevalent Where there is no Health Officer.......xxxvii
  - Public Safety Should Have the Benefit of the Doubt in Diagnosis of.......240
  - Removal of Persons Infected with.......206, 209, 300, 303, 304
  - Restriction of, in Jails and Poorhouses.......304
  - See "Contagious Diseases," "Diphtheria," "Scarlet Fever," "Small-pox," etc.
- Disease-Germs, Modification of, by Cultivation.......xliv, 201-3
  - Vegetable Combustion and Assimilation do not always Destroy.......204
- Diseases in Animals in Mich., in 1880, Summary of Replies Concerning.......265-6
- Diseases of Animals, Dr. Baker Committee on.......viii
- Diseases in Fruits, Cereals, Grasses, etc., in 1880, Summary of Replies Concerning.......266
- Diseases in Mich. by Months in 1878-9-80, Diagrams, Per Cent of Reports...113, 119, 121, 308, 382, 400-1
- Diseases in Mich. in 1880, Replies and Summary of Replies by Correspondents to Circular 40. 252-88
  - In Mich. in 1880, Replies by Correspondents to Circular 40, concerning,—at:—
    - Bay City, by W. R. Marsh, M. D.......275
    - Brockway Center, by A. Mitchell, M. D.......275
    - Clinton, by A. W. Alvord, M. D.......281-2
    - Delaware Mine, by T. D. Bradfield, M. D.,.......273
    - Detroit, by Judson Bradley, M. D.......286
    - DeWitt, by G. W. Topping, M. D.......277
    - Escanaba, by W. W. Mulliken, M. D.,.......273-4
    - Flint, by H. C. Fairbank, M. D.......277-8
    - Gaines, by J. Marshall, M. D.......278
    - Grand Rapids, by Arthur Hazlewood, M. D.......274
    - Hastings, by A. P. Drake, M. D.......278
    - Hillsdale, by J. W. Falley, M. D.......282
    - Hudson, by A. R. Smart, M. D.......282-3
    - Ionia, by W. F. Reed, M. D.......278
    - Manchester, by A. C. Taylor, M. D.......283
    - Mendon, by H. C. Clapp, M. D.......283-4
    - Muir, by L. S. Stevens, M. D.......279
    - Niles, by S. Belknap, M. D.......280
    - Northville, by J. M. Swift, M. D.......286
    - Otsego, by Milton Chase, M. D.......281-2
    - Otsego Lake, by N. R. Gilbert, M. D.......274
    - Petoskey, by H. T. Calkins, M. D.......274
    - Pokagon, by C. P. Wells, M. D.......281
    - Pontiac, by Walter G. Elliott. D. M,.......286-7
    - Pontiac, by J. P. Wilson, M. D.......287
    - St. Johns, by G. E. Corbin, M. D.......279
    - Tecumseh, by C. M. Woodward, M. D.......284
    - Thornville, by John S. Caulkins, M. D,.......275-7
    - Three Rivers, by C. W. Backus, M. D.......284
    - Union City, by N. H. Claflin, M. D.......284-5
    - Vicksburg, by S. C. Van Antwerp, M. D.......285
    - Webberville, by R. B. Smith, M. D.......279-80
    - Wyandotte, by E. P. Christian, M. D.......287-8
    - Ypsilanti, by Edward Batwell, M. D.......285-6
- Diseases in Mich. in 1880, Compilation of Weekly Reports of.......305, 402
- Diseases More or Less than Usually Prevalent in 1880, and Supposed Causes.......256, 258-9, 273-88
- Diseases, Names of, Should not be Allowed on Packages of Medicines.......158-9
  - Nature, Causation, and Prevention of, Topics for Examinations in Sanitary Science.......232-3
  - Increased or decreased Mortality of, in 1880, and Supposed Causes.......260-1, 273-88
  - Order of Prevalence of, in Mich. in 1880.......264, 273-88, 314-19, 326-75, 377-9, 381-402
  - Prevalence of, Controlled by Fixed Laws.......104
  - Spread of, by Schools, in Mich. in 1880.......264, 273-87
  - Virulent, Causes of Re-appearance of.......203
  - Which Caused Most Sickness in Mich. in 1880.......262-3, 264, 265, 273-88, 312-13, 376-8
- Disinfectant, Fresh Air as a.......207, 215, 216
- Disinfected (?) Clothing, Communication of Small-pox by.......xl-xli
- Disinfection, Drs. Baker and Kellogg to Prepare Tract on.......xli

PAGE.

Disinfection in Case of Diphtheria, Scarlet Fever, Small-pox, etc. 206-8, 214-16, 220, 296, 297-8
  of House, Need for Temporary Shelter of Inmates during 208, 217
Dissemination of Information by the State Board of Health, concerning Methods of ..... viii, xvii-xviii
Doctors in Michigan, concerning Expenses for Services of 91
Documents on Prevention and Restriction of Diphtheria, Scarlet Fever, Small-pox, etc. ..... 205-220, 289-301.
Dodge, Dr. J. R., on Vaccination, Burial of Dead, Nuisances, etc. lii
Dogs, Experiments in Communication of Consumption to 144-5, 146
Domestic Sanitation, Dr. J. H. Jerome on 44-9
  Dr. J. H. Kellogg on 16-25
Donors of Books, etc., Fiscal Year 1881, Alphabetical List ..... xx-xxvii
Drake, W. T., Meteorological instruments intrusted to, Fiscal Year 1881 xix
Drake, M. D., A. P., Replies to Circular 40, Diseases in 1880 278
  Weekly reports of Diseases by, Compiled by Months 324, 327-74
Drainage, Benefits from Dr. Lyster's Paper on 174
  Importance of, to Water-supply 45-6
  of a House-site, Importance of 39, 40
  Not Always a Protection against Intermittent Fever 65-6
Drainage, etc., Titles of Acts relative to, Passed by Legislature in 1881 191-4
Drainage and Sewerage, Distinct Operations, Defined 26
Drains, Sewers, Cesspools, etc., Contamination of Air by 22
Drenthe, Reports of Sickness at, in 1880, Compiled by Months 324, 326-70
Drowned, Document on Resuscitation of, to be Revised by Drs. Hazlewood and Baker xlii
Drowned, Lives Saved by Documents on Resuscitation of 173
Druggists Abettors of Abortion 165
Drugs and Foods, Resolution for a National Law to Prevent 68
Dry-earth Sewerage-system, Dr. D. Clark on 27
Duncan, M. D. A. McD., Weekly Reports of Diseases by, Compiled by Months 325, 328-39
Durand, Hon. Geo. H., President of Flint Sanitary Convention, Address by 3, 4, 9-16
Dwellings, Damp and Dark, concerning Sickness Induced by 39-40, 59-60
Dwellings, Importance of a Sanitary Supervision of 59-60
Dwellings, Influences of near Forests on 40-42, 43
Dwellings of Pioneers, concerning Unsanitary Conditions of 39-43
Dysentery, Av. Order of Prevalence, Where and When Present, Year and Months, 1880 ..... 314-19, 326-73, 379.
  Comparative Amount of Sickness in Michigan in 1880, Caused by 262-3, 312-3, 401
  Diagram, Per Cent of Weekly Reports of, by Months in 1880 401
  Diagrams, Per Cent of Weekly Reports of, in Mich. by Months in 1878 and 1879 ..... 119, 121
  No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880 362-3
  Per Cent of Observers Reporting, by Months and Year, 1880 ..... 312-19, 379
  Per Cent of Weekly Reports of, State and Divisions, Year and Months in 1889 ..... 314-23, 379, 401
  Per Cent of Weeks Present Where Present, Year and Months, 1880 ..... 314-19, 326-73, 379
  Times Reported Usually or More or Less than Usually Severe in 1880 314-19

E.

Earth-worms Carry Bacteria up through Overlying Earth 29
East Saginaw, Invitation to Hold Sanitary Convention at xxxvii
  Reports of Sickness at, in 1880, Compiled by Months 324, 327-38, 352-74
Echo Township, Antrim Co., concerning Spread of Diphtheria at ..... xlix-l
Education, Physical, of Children, Importance of 35-6
Elliott, M. D., W. G., on Disinfection of Material infected with Scarlet fever lv
  Replies to Circular 40, Diseases in 1880 286-7
  Weekly Reports of Diseases by, Compiled by Months 325, 353-75
Ellis, M. D., L. S., Weekly Reports of Diseases by, Compiled by Months 324, 332-42
Elsie, Reports of Sickness at, in 1880, Compiled by Months 324, 327-74
England, Deaths from Small-pox in, before and after Introduction of Vaccination 290
Epidemics, Attenuation of Virus by the Air a Factor in the Extinction of 203
Epidemic, Endemic, and Contagious Diseases, Dr. Lyster Committee on ..... viii, xxxv
Epidemics, Pasteur on Spontaneous Appearance of 203
Erysipelas, Av. Order of Prevalence, Where and When Present, Year and Months, 1880 ..... 314-19, 326-73, 379.
  Comparative Amount of Sickness in Michigan in 1880, Caused by 262-3, 312-13, 390
  Diagram, Per Cent of Weekly Reports of, by Months in 1880 390
  No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880 262-3

PAGE.

- Erysipelas,—*Continued*,—
  - Per Cent of Observers Reporting, Months and Year, 1880 ..... 312-19, 379
  - Per Cent of Weekly Reports of, State and Divisions, Year and Months, 1880 ..... 314-23, 379, 390
  - Per Cent of Weeks Present Where Present, Year and Months, 1880 ..... 314-19, 326-73, 379
  - Times Reported Usually or More or Less than Usually Severe in 1880 314-19
- Escanaba, Meteorological Conditions at, in 1880, Compiled by Months 404, 405, 414-67
  - Reports of Deaths and Sickness in, in 1880 ..... 254, 258, 260, 272, 273-4
  - Small-pox brought by Immigrants to liv
- Eucalyptus globulus, Protection from Fevers by 64
- Eucalyptus Tree, Great Absorption of Water by 41-2
- Examinations in Sanitary Science by this Board, Regulations, Questions in 1881 232-36
- Excreta and Decomposing Organic Matter, Dr. Kellogg Committee on Disposal of viii
- Excretion, Digestion, and Assimilation Most Rapid in Forenoon 52
- Eyes, Diseases of, Prevalent in Treeless Countries 62
- Exhibits 1-46, Sickness and Meteorology 257-69, 309-402, 404-65
- Exhibits of Diseases and Meteorological Conditions, What is Shown by, and How to Study 387
- Expenditures by the Board Fiscal Year 1881, and Calendar Year 1880 xxxii
- Explosions of Steam boilers, and No. of Persons Killed and Wounded by, in the United States in 1880 102

F.

- Fair, J. E., Meteorological instruments intrusted to, Fiscal Year 1881 ..... xviii, xix
  - Reports Whooping-cough at Harrisville in Nov., 1880 371
- Fairbank, M. D., H. C., on the Employment of Intemperate Persons on Steamboats, Railroads, etc. 103
  - On Diphtheria at State Institution for Deaf and Dumb at Flint xlviii
  - On Winter-cholera at Flint lxi
  - of Local Committee for Flint Sanitary Convention 4
  - on Sickness at Flint in Sept., 1880 361
  - Replies to Circular 40, Diseases in 1880 277-8
  - on Typhoid Fever, Contaminated Water, etc. 44
- Falley, M. D., J. W., Replies to Circular 40, Diseases in 1880 282
  - Weekly Reports of Diseases by, Compiled by Months 325, 328-75
- Farnsworth, Jr., D. D. S., James H., Reference to Paper by, on Preservation of the Teeth 177
- Farnum, M. D., James K., Weekly reports of Diseases by, Compiled by Months 324, 352-74
- Fatty Food, concerning Force-value of 51-2
- Feather-beds, etc., Contamination of Air by 22-3
- Fever, Concerning Nature of, at New Orleans in Summer of 1880 240
- Fever, Intermittent, Remittent, etc., *See Intermittent, Remittent, Typhoid, etc., Fever.*
- Fevers, Malarial, Prevalent near Fresh-plowed New Soil 41, 45
- Fevers, Unclean Persons More Susceptible to 17-18
- Filth as a Cause of Diphtheria and Typhoid fever, Much that seems to Disprove it 104, 105
- Flagg, Eli, of Local Committee on Battle Creek Sanitary Convention 88
- Flesh of Diseased Animals, concerning Use of, as Food 23-5
- Flint, concerning Winter Cholera at, in 1881 lxi
  - Concerning Diphtheria at Institution for the Deaf and Dumb in ..... xlviii-xlix, 71-75
  - Proceedings and Addresses at the Sanitary Convention at 1-83
  - Reports of Deaths and Sickness in, in 1880 ..... 254, 258, 260, 277-8, 361
- Fogs, Frosts, Ground Frozen, Rivers, etc., Directions for Observing 410
- Fogs, No. of Days Observed, No. of Observations of, etc., at 24 Stations in Mich., by Months in 1880 438-42
- Food, Alcohol Not Food in Health 135-6
- Foods, concerning Adulteration and Contamination of 23-5, 46-7, 68
- Foods, Definition, Action, and Classification of 49-50
- Foods and Drugs, Resolution for a National Law to Prevent Adulteration of 68
- Foods, Prof. Vaughan on Force Value of, with Experiments 49-53
- Foods, What Foods Suitable for Different Meals 53
- Ford, M. D., C. S., Weekly reports of Diseases by, Compiled by Months 324, 326-74
- Forests, Dependence of Industries on 67-8
- Forests, Influences of, on Dwellings near Them 40-42, 43
- Forest, at Least 20 Per Cent of a Country should be 66
- Forests and Trees as Sanitary Factors, Dr. Caulkins on 61-8
- Forms E and F, for Return of Addresses of Health Officers ..... xiv, xv-xvi
- Form I, for Annual Reports by Health Officers ..... x-xii
- Fourth-of-July Accidents Largely Preventable 101

PAGE.

Foy, Private John T., Meteorological Registers Received from, Compiled by Months..404, 405, 418-467
Frederic, Crawford Co., Report of Diphtheria at..........xli, lvi-lviii
Fremont Center, Concerning Diphtheria at.......... 1
French, M. D., S. S., Report by, on Criminal Abortion.......... 164-6
of Local Committee on Battle Creek Sanitary Convention.......... 88
Weekly reports of Diseases by, Compiled by Months..........325, 328-59
Fruit Sugars, Concerning Presence of, in Cane Sugars.......... 242-7
Funerals of Decedents from Diphtheria, Scarlet Fever, Small-pox, etc., relative to, 206, 207, 213, 215, 220, 298, 302.
Funerals, Public, of Decedents from Contagious Diseases Illegal in New York.......... 8
Funerals, Public, Should not be held for Decedents from Contagious Diseases..........207, 215, 220, 298
Fungus (*Phallus impudicus?*), Abundance of, near Reed City.......... xlix

G.

Gaines, Cases of Poisoning at, from Eating Apple Jelly made in Copper Pans..........xxxvi, lviii
Reports of Deaths and Sickness in, in 1880..........254, 258, 260, 278
Galbraith, Dr. F. B., Vice-president Flint Sanitary Convention.......... 3
Galvanized iron Cooking Vessels, Danger of Zinc-poisoning by..........xxxvi, lviii
Garland and Mamie, concerning Collision of, in Detroit River.......... 96, 99
Gass, Prof. M. T., on Work of Public Schools and Health of Pupils..........5, 78-83
Geographical Divisions in Michigan, Counties in Each of Eleven.......... 257
Gihon, Dr. A. L., on Syphilis in the U. S. Army and Navy.......... 197
Gilbert, M. D., N. R., Replies to Circular 40, Diseases in 1880.......... 274
Gillespie, Rt. Rev. Geo. D., Report on the Grand Rapids Sanitary Association.......... 5, 75-7
Reference to Address by, as President of a Sanitary Convention.......... 177
Gilligan, Sergt. J., Meteorological Registers Received from, Compiled by Months.....404, 405, 414-67
Glandered Horses, Report of a Prosecution for Selling.......... liii-liv
Glucose and Cane Sugars and Syrups, Analyses of, by Prof. S. P. Sharples..........xxxvi, 242-8
Glucose, Concerning Wholesomeness of.......... 245, 246
Glucose, Formed in Process of Digestion.......... 245
Glucose in all Cane Sugar..........242, 244-6, 247
Glucose Should Bear Its Own Name in Market.......... 246
Goodman, Rev. J. S., Reference to Paper by, on Relation of Schools to Health.......... 176
Goodwin, Dr. F., on Winter Cholera in Cassopolis.......... lxi
Weekly reports of Diseases by, Compiled by Months..........325, 328-39
Grade-work of Schools, and Health of Pupils, Prof. Gass on.......... 78-83
Grafton, J. J., Meteorological Registers from, Compiled by Months..........404, 422-464
Meteorological instruments in care of, turned over to Col. Watkins.......... xix
Grand Haven, Av. Temperature at, by Months in 1879, Diagram.......... 115
Meteorological Conditions at, in 1880, Compiled by Months..........404, 405, 418-67
Reports of Sickness at, in 1880, Compiled by Months..........324, 326-74
Grand Rapids, Natural Sanitary Advantages of.......... 75
Reports of Deaths and Sickness in, in 1880..........254, 258, 260, 274
Reports of Sickness at, in 1880, Compiled by Months..........274, 262-3, 324, 326-74
Grand Rapids Sanitary Association, Report concerning, Papers before, etc..........lxii, 75-7
Grape Sugars, concerning Presence of, in Cane Sugars, Analyses of, etc..........xxxvi, 242-7
Grasses, Fruits, Cereals, etc., Summary of Replies Concerning Diseases of, in 1880.......... 266, 270
Graves, Concerning the Depth to which Graves should be dug.......... lii, liii
Graves, Judge B. F., Vice-president Battle Creek Sanitary Convention.......... 87
on the Relation of Moral Education to Criminal Abortion.......... 167-8
Great Dismal Swamp District Free from Ague (?).......... 64-5
Greenville, Report of Cases of Small-pox near.......... xli
Reports of Sickness at, in 1880, Compiled by Months..........324, 340-58
Griffin, Dr. E. L., of Fond du Lac, Wis., Propagates Bovine Vaccine Virus.......... 292
Ground-Water, Directions for Observing and Recording.......... 410, 270
Ground-Water in Mich. in 1880, Summary of Replies concerning.......... 268-9
Gumaer, A. G., Meteorological Registers from, Compiled by Months..........404, 414-64
Meteorological instruments in care of, turned over to W. T. Drake.......... xix

H.

Hagadorn, M. D., A. F., Weekly Reports of Diseases by, Compiled by Months..........324, 352-74
Hair Dyes, Harmful Substances in.......... 156
Hall, J. R., on Scarlet fever at South Blendon, Ottawa Co.......... lii
Hancock, Sergt. Geo. R., Meteorological Registers from, Compiled by Months..........404, 405, 414-467

PAGE.
Harrington, Prof. M. W., Meteorological Registers from, Compiled by Months 404, 414-64
Harrisville, Report of Whooping-cough at 371
Hastings, Meteorological Conditions at, in 1880, Compiled by Months 404, 414-42
    Reports of Deaths and Sickness in, in 1880 .... 254, 258, 278
    Reports of Sickness at, in 1880, Compiled by Months 324, 326-74
Hastings Township, Barry Co., Concerning Diphtheria at 1
Hathaway, M. D., J. R., Weekly Reports of Diseases by, Compiled by Months 324, 333-9
Hauxhurst, Dr. D. C., on the Need of Intelligent Co-operation for Efficient Sanitary Work. 141
    on the Examination of Railway and Steamboat Employees, etc. 103
Hauxhurst, M. D., J. W., Report on Diphtheria in Frederic township, Crawford Co. .... xli, lvi-lviii
    Weekly Reports of Diseases by, Compiled by Months 324, 327-74
Hay-crop, Summary of Replies Relative to Condition in which it was Secured in 1880 .... 266, 270
Haynes, D. O., Made an Exhibit of Disinfectants at Flint Sanitary Convention 70
Hazlewood, M. D., Arthur, Member of State Board of Health, Postoffice Address, etc. vii
    of Committee to Revise Document on Resuscitation of Drowned xlii
    Questions at Examination in Sanitary Science in 1881 234
    Reference to Papers by, in Annual Reports of this Board 176, 177, 178
    Replies to Circular 40, Diseases in 1880 274
    Weekly Reports of Diseases by, Compiled by Months 324, 326-74
Hawley, Dr. H. C., Report on Diphtheria at Hesperia, Oceana Co. xlvii
Health-Column in Local Press, Recommendation of 70
Health, concerning Dangers to, in Pioneer Life 38-43
Health Endangered by Lack of Individual Cleanliness 17-18
Health Legislation in Michigan, in 1881, Abstract relative to 191-4
Health Officer of a City, Concerning Duties, Qualifications, and Pay of 56, 57, 58, 59, 61
Health Officer of Detroit, Compensation and Duties of 61
Health Officers, Blank Form for Report from, for 1880, and Circular .... ix-xii
    Blank Forms for Returning Addresses of, for 1881, and Circulars demanding returns .... xiii-xvi
    Duties of, in the Restriction and Prevention of Contagious Diseases, etc. .... 206, 213, 302, ix-x
    Local Boards Must Report Addresses of, to State Board of Health .... xiii, xv
    Number Returned in 1881 xvi
    Should be Instructed to Act Promptly on Outbreak of a Contagious Disease .... xlv, 206, 213, 301, 302
    Should be Paid for Their Services 138
    Should Take Oath of Office .... xiii, xv
    Two Hindrances to Work of 237-8
Health Officers and Clerks, Number of Reports Received from, for 1880 xii
Health of the People the First Duty of the Physician 169
Health of Pupils and their Work, Prof. M. T. Gass on 78-83
Health Service of a State, Dr. Ranney on The 169-79
Heart Diseases, Deaths from, in Mich., for Each of the Years 1869-77 111
Heating of Air, in Rooms and in Tubes, Experiments by Rev. Jacokes and Dr. Kedzie .... xxxv-xxxvi
Henderson, M. D., Robert, Weekly reports of Diseases by, Compiled by Months 325, 328-75
Hendry, M. D., George, Weekly reports of Diseases by, Compiled by Months 324, 327-38
Heredity, Influence of, in Deteriorating Race 17
Heredity, Regard for, a Vital Part of Sanitation 17, 35
Herig, M. D., E. A., Weekly reports of Diseases by, Compiled by Months 324, 327-70
Hesperia, Special Reports Concerning Diphtheria near .... xlvii-xlviii
Hillsdale, Reports of Deaths and Sickness in, in 1880 .... 254, 258, 260, 282
    Reports of Sickness at, in 1880, Compiled by Months 182, 262-3, 325, 328-75
Hitchcock, M. D., Homer O., on the Prevention of Accidents 104
    Reference to Papers by, in Annual Reports of this Board 175-8
    Report by, on Criminal Abortion 164-6
Hog Cholera Communicated to other Animals .... lviii, lix, lx
    Concerning Communication of, to Man .... lx, 266
    Concerning Relations of Winter Cholera to .... xxxix-xl, lx-lxi
    Hard to Restrict, Best to Kill Animals First Attacked lix
    in Southwestern Mich., Report on, by Henry B. Baker, M. D. .... (xxxiv-xxxv), xxxvii, lviii-lxii
    in Mich. in 1880, Summary of Replies Concerning 265-6
    Pathology, Period of Incubation, Nature, Symptoms, etc. .... lix-lx
    Poison of, Easily Destroyed lx
Hogs, Diseased, concerning Slaughter of, at Chicago 48
Holden, Capt. Geo. R., Meteorological Instruments intrusted to, Fiscal Year 1881 xix
Holly, M. D., D. C., Weekly reports of Diseases by, Compiled by Months 325, 327-59
Hospitals for Communicable Diseases, Dr. Baker to Prepare a Tract on xliv

PAGE.
Hospitals, Construction, Ventilation, Warming of, Laws relating to, etc..........206, 213, 299-300
Hospitals for Use during Disinfection of Houses, Need for.......... 208, 217
Houghton, Reports of Sickness at, in 1880, Compiled by Months..........324, 326-74
House, Site of, should be Drained.......... 39, 40
Householders, concerning Duties of.......... 138, 139
Householders and Physicians Must Give Notice of Communicable Diseases,—Penalty..205, 212, 295-6
Howard City, Reports of Sickness at in 1880, Compiled by Months..........324, 333-9
Howell, Reports of Sickness at, in 1880, Compiled by Months..........325, 327-67
Howlett, Wm. H., Report on Diphtheria in Bunkerhill Township, Ingham Co.......... xlvi
Hubbardston, Reports of Sickness at, in 1880, Compiled by Months..........325, 327-71
Hudson, Meteorological Conditions at, in 1880, Compiled by Months..........404, 422-64
  Reports of Death's and Sickness in, in 1880..........254, 258, 260, 282-3, 325, 333-5, 341-3, 353-75
Humidity, Absolute, at Agr'l College in 1880 and Previous Years, Compared by Months.......... 427
  Absolute, Av. by Months in 1880 at 15 Stations, Table and Diagrams.......... 429-31
  Absolute, Av. at Stations, in 1880 and 1879, Compared by Months.......... 428
  Absolute and Relative, at Thornville, by Months in 1880.......... 276
  Atmospheric, Amount of Vapor of Water Inhaled Daily..........381, 426-7
  Av. Relative at Stations in Mich. in 1879 and 1880, Compared by Years and Months.......... 435
  Av. Relative, at 15 Stations in Mich. by Months in 1880, Table and Diagram.......... 432-4
  of Air and Coincident Sickness in Mich., by Months in 1880..........380-402, 427
  of Air, Instruments and Directions for Observing.......... 407-8
  of Air in May, 1880, Exceptional, concerning.......... 427, 428
  of Air, concerning Absolute and Relative Statements of.......... 426-7
Hygiene, Resolution by American Public Health Association for National Museum of.......... 241
Hygiene, Advancement in, during War of the Rebellion.......... 178

I.

Ice, Rendered Impure by Decomposing Sawdust.......... xxxiii
Ill-health of Pupils Often Not Due to Over-study.......... 78-83
Illuminating Oils, Every Barrel or Package Must be Tested in Mich..........xxxix, 249-51
  Inspection of, in Mich., Not Perfect.......... 100-101
  Michigan Test for.......... 249
  Review of Work of this Board relative to.......... 172-189
Imagination, Influence of, in Cure of Diseases.......... 164
Immigrants, Reports of Small-pox Brought by.......... xli, liv
  Resolutions Urging Inspection of, to Prevent Importation of Contagious Diseases by..xlii-xliii
Incubation-period of Hog-cholera.......... lix
Incubation-period of Scarlet Fever.......... 211
India, Great Benefits from Certain Sanitary Measures in.......... 12-14
Inebriety, The Use of Soothing-syrups and Cordials Productive of.......... 161-3
Infected Material, Care and Disposal of, in Contagious Diseases..........206, 207-8, 209, 211, 213-16, 219-20, 296, 297-8, 303-4.
Infected Places, Notice of, Should be Given, by Local Board of Health..........205, 206, 213, 296, 302
Infectious Diseases, See "Contagious Diseases" and "Diseases Dangerous to Public Health."
Inflammation of Brain or Bowels, See "Brain or Bowels, Inflammation of."
Influenza, Av. Order of Prevalence Where and When Present, Year and Months, 1880.......... 314-19, 329-75, 377-9, 389.
  Comparative Amount of Sickness in Michigan in 1880, Caused by..........262-3, 312-19, 377-8, 382
  Diagram, Per cent of Weekly Reports of, by Months in 1880.......... 382
  in 1880, Special Reports concerning.......... 331-74
  No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880.......... 262-3
  Per cent of Observers Reporting, by Months and Year, 1880..........312-19, 379
  Per cent of Weekly Reports of, State and Divisions, Year and Months, 1880..314-23, 377-9, 382, 389
  Per cent of Weeks Present Where Present, Year and Months in 1880..........314-19, 329-75, 379
  Relations of, to Meteorological Conditions, by Months in 1880.......... 389, 402
  Times Reported Usually or More or Less than Usually Severe in 1880.......... 314-19
Insane and Inebriates, concerning care of..........227, 228, 229
Insane, The, Concerning Treatment of, in Asylums and at Home.......... 228-9
  Five Thousand in Illinois in 1880.......... 228
  Not More Frequently Cured than they used to be.......... 229
  Number of, in the U. S. underestimated.......... 228
  Reasons for Apparent Increase in Number of.......... 227
Inspection, of Immigrants for Contagious Diseases, Need for, etc..........xlii-xliii
  Sanitary, In Towns, Cities, Villages, and Railroad-centers, need for.......... 186, 187

PAGE.
Inspection, of Travelers and Restraint of Infected Persons, Duty of Boards of Health....... 302-4
  Law Requires each Barrel, etc., of Oil to be Subjected to.......xxxix, 250, 251
Intemperance as a Destroyer of Human Life, Mrs. E. Clark on....... 30-31
Intemperate Men Should not be Employed on Railroads and Steamboats....... 103
Intermittent Fever, Av. Order of Prevalence Where and When Present, Year and Months, 1880.......314-19, 326-73, 377-9, 398
  Comparative Amount of Sickness in Michigan in 1880, Caused by.......262-3, 312-13, 377-8, 400
  Concerning Distance Winds may carry Germs of....... 66
  Diagram, Per cent of Weekly Reports of, by Months in 1880....... 400
  Diagram, Per cent of Weekly Reports Stating Presence of, in Mich. by Months in 1879.. 113
  Need for Systematic Study of Causation of.......xxxiv, 124
  No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880....... 262-3
  Per cent of Observers Reporting, Months and Year, 1880.......312-19, 379
  Per cent of Weekly Reports of, State and Divisions, Year and Months, 1880..314-23, 377-9, 393-400
  Per cent of Weeks Present Where Present, Year and Months, 1880.......314-19, 326-73, 379
  Relations of Meteorological Conditions to, by Months in 1880....... 398, 402
  Times Reported Usually, or More or Less than Usually Severe in 1880....... 314-19
  Prevalence of, in Dry Localities....... 65-6
  Protection from, by Trees.......40-41, 63-5
  Sickness from, Associated with Damp, Low Dwellings.......39-40, 60
International Medical Congress, relative to Appointment of Delegate to.......xxxviii-xxxix
Invert Sugar, Presence of, in Cane Sugars.......242, 244, 245
Ionia, Reports of Sickness at, in 1880, Compiled by Months.......278, 262-3, 325, 327-74
Ithaca, Reports of Sickness at, in 1880, Compiled by Months.......325, 327-43

J.

Jacobi, Dr. Mary Putnam, on the Moral and Non-Asylum Treatment of the Insane....... 228-9
Jacokes, Rev. D. C., Condemns Public Funerals of Decedents from Contagious Diseases.... 25
  Gave an Address on Pure Air in Dwellings,....... 5, 77
  Introductory Address at Battle Creek Sanitary Convention....... 88, 90-93
  Member and Committee of State Board of Health, Post office Address, etc.......vii-viii, xxxv
  of committee to Devise Plan for Regulation of Practice of Medicine....... xxxiv
  of Committee on Sanitary Conventions....... 4, 88
  on Drawing off Foul Air from Rooms....... xxxv
  on Alcohol Not a Useful Food....... 136
  on the Importance of Disseminating Sanitary Knowledge to the People....... 125
  on the Need of Information in Regard to Criminal Abortions....... 167
  Recommends use of Mineral Seal Oil....... 103-4
  Reference to Paper by, on Heating and Ventilating Dwellings and Halls already Constructed....... 176
Jacokes, Rev. T. H., on the Importance of knowing the Nature of Alcohol....... 134-35
Jackson, Concerning an Epidemic of Cerebro-spinal Meningitis at....... lv-lvi
  Concerning Wrecking of Pacific Express at.......96, 97-8
  Reports of Sickness at, in 1880, Compiled by Months.......325, 328-75
Jails and Poorhouses, Restriction of Contagious Diseases in....... 304
Jelly (Apple), Containing Zinc Oxide, Poisoning of a Family by.......xxxvi, lviii
Jennison, Mrs. William, Reference to Paper by, on Training-Schools of Cookery....... 176
Jerome, M. D., J. H., on Mortality from Diphtheria....... 74
  Paper on Importance of Domestic Sanitation....... 4, 44-9
  Uses Three Sewer-traps in Each Pipe....... 30
Johnston, M. D., Robert, Weekly reports of Diseases by, Compiled by Months.......325, 328-75
Jones, M. D., H. W., Weekly reports of Diseases by, Compiled by Months.......324, 326-74
Joy, M. D., H. L., Weekly reports of Diseases by, Compiled by Months.......325, 328-75
Juniper Tree, concerning Anti-malarial powers of....... 65
Jungk, Ph. D., Carl, Reference to Paper by, on Adulteration of Food....... 176
Jussæa grandiflora, concerning Anti-malarial Properties of....... 65

K.

Kalamazoo, Av. Temperature at, by Months in 1879, Diagram....... 115
  Reports of Sickness at, in 1880, Compiled by Months.......325, 328-75
Kapp, M. D., John, Weekly reports of Diseases by, Compiled by Months.......325, 328-43
Kedzie, Prof. R. C., analysis of Apple Jelly which poisoned seven in one family.......xxxvi, lviii
  Annual Address by, as President of this Board....... 189-90
  Examination by, of Peaches having the Yellows....... xxxvi

PAGE.

- Kedzie, Prof. R. C.,—*Continued*,—
  - Introductory Address at Flint Sanitary Convention...... 4, 6–9
  - Meteorological Registers from, Compiled by Months...... 404, 405, 413–450
  - of Committee on Disinfectants...... 16, 70
  - on Humidity of Air in May, 1880...... 428
  - on Sickness and Water-supply...... 44
  - on Stockyards and Slaughterhouses in Chicago...... 68
  - Reference to Papers by, in Annual Reports of this Board...... 175–8
  - Requested to Attend Evansville Meeting of Sanitary Council of Mississippi Valley...... xl
  - Retirement of, from the State Board of Health, Resolutions, Communication, etc...xxxviii, xl, 189
- Kellogg, M. D., J. H., Committee to Report on Criminal Abortion...... xlii
  - Member and Committee of State Board of Health, Postoffice Address, etc...... vii-viii
  - Meteorological instruments intrusted to, Fiscal Year 1881...... xix
  - Meteorological Registers from, Compiled by Months...... 404, 405, 418–64
  - of Committee on Disinfectants, and to Prepare Tract on Disinfection...... xli, 16
  - on the Relation of Preventable Sickness to Taxation...... 221–6
  - Paper by, on Domestic Sanitation...... 4, 16–25
  - Questions at Examination in Sanitary Science in 1881...... 235
  - Reference to Papers by, in Annual Reports of this Board...... 176, 177
  - Secretary, and of Local Committee, at Battle Creek Sanitary Convention...... 87, 88, 188
- Kerosene, etc., Title of an Act to Prohibit Carrying of, on Passenger Trains...... 193
- Kimball, M. D., E. L., Weekly Reports of Diseases by, Compiled by Months...... 325, 328–75
- Kingman, A. C., of Local Committee on Battle Creek Sanitary Convention...... 88
  - on Prevention of Casualties...... 103
- Kinne, M. D., A. F., on Action of Alcohol on Vital Functions...... 89, 126–134
- Kitchen, M. D., Samuel, Weekly Reports of Diseases by, Compiled by Months...... 324, 327–38
- Klebs, on Communicability of Consumption...... 143
- Koon, M. D., C. E., Weekly Reports of Diseases by, Compiled by Months...... 324, 364–70
- Kremers, M. D., Henry, Weekly Reports of Diseases by, Compiled by Months...... 324, 326–70

L.

- Lævulose and Dextrose, Hydrochloric Acid Changes Cane Sugar to...... 244
- La Montagne, M. D., Geo., Weekly Reports of Diseases by, Compiled by Months...... 324, 340–74
- Lampman, M. D., J. C., Weekly Reports of Diseases by, Compiled by Months...... 324, 345–55, 369–74
- Lansing, Av. Temp. and Av. Night Ozone at, by Months in 1879, Diagrams...... 115, 120
  - Reports of Sickness at, in 1880, Compiled by Months...... 325, 327–74
- Lapeer, Reports of Sickness at, in 1880, Compiled by Months...... 324, 327–74
- Lat., Long., Elevation, Temp., and Atmospheric Pressure, in 1880, of 29 Stations in Mich...... 405
- LAWS OF MICHIGAN, SECTIONS QUOTED:—
  - *Compilation of 1871:—*
    - 1692 and 1693, as amended in 1877, Constitution of Local Boards of Health and Appointment of Health Officers...... xiii, xiv, 137
    - 1698, Boards of Health must Give Notice of Regulations...... 302
    - 1705, Boards of Health May Permit Removal of Infected Articles or Persons...... 303
    - 1706, 1707, Boards of Health must make Provision by Hospitals or Otherwise against the Spread of Contagious Diseases...... 206, 213, 300
    - 1708, Boards of Health may Restrain Travelers Coming from Infected Districts...... 303
    - 1709, Infected Persons may be Removed by Warrant...... 303
    - 1710—1713, Securing, Removal, and Care of Infected Baggage, Clothing, Goods, etc...... 303–4
    - 1714, 1706, Pay for Nurses, Supplies, Houses, etc., a County Charge...... 300, 301
    - 1715-17, Infected Prisoners and Paupers may be Removed from Poorhouses and Jails 304
    - 1726, Boards of Health May Establish Hospitals for Restriction of Contagious Diseases...... 299
    - 1727–31, 1733, Regulations for Hospitals for Infected Persons...... 299
    - 1731, 1706, 1707, Concerning Removal of Infected Persons to Hospitals...... 300
    - 1732, Boards of Health must give Public Notice of Infected Places...... 206, 213, 301
    - 1734-5, Householders and Physicians must give Notice of Diseases Dangerous to the Public Health...... 205, 212, 295
    - 1740 (Amended), Constitution of City and Village Boards of Health...... xiv-xv, 205, 212, 295–6
  - *Session Laws:*
    - 1873, Act No. 81, Section 8, Local Boards to Report to State Board of Health...... ix
    - 1879, Act No. 146, Section 1, Boards of Health Authorized to Furnish Vaccination...... 301
- Laws, already enacted, relative to Accidents, should be more rigidly Enforced...... 102
- Laws, more Stringent, needed to Prevent Accidents...... 102
- Laws of 1881 Provide for a Uniform System of Signals for Railroads...... 102

PAGE.

Laws, relating to Public Health, Titles of Acts Passed in 1881 ... 191-4
Leach, M. D., Elisha, Weekly reports of Diseases by, Compiled by Months ... 325, 333-47
Lead-poisoning by use of tinned ware, etc., Review of Dr. Kedzie's paper on ... 171
Lee, D. D., Rev. Luther, Offered Prayer at the Flint Sanitary Convention ... 4, 5
Lee, M. D., N. D., Weekly reports of Diseases by, Compiled by Months ... 324, 327-74
Leeson, M. D., John, Weekly reports of Diseases by, Compiled by Months ... 324, 348-74
Legal and other Measures for the Prevention of Casualties, concerning ... 95-104
Legislation in Interests of Public Health, Mr. Parker Committee on ... viii
Leprosy Prevalent in Treeless Counties ... 63
Leroy, Calhoun Co., Report on Hog Cholera at ... lviii-lx
Letcher, Dr. J. H., Resolutions by, Urging Vaccination ... 239-40
Lexington, Reports of Sickness at, in 1880, Compiled by Months ... 324, 327-74
Library of the Board, Alphabetical List of Donors to, Fiscal Year 1881 ... xx-xxli
 Additions to, by Purchase ... xix-xx
Life, Av. of, Prolonged 25 to 40 Per Cent in last Fifty Years ... 170
Life, Increase of Av. Length of, Not Necessarily an Increase of Vitality of the Race ... 16-17
Life of an Individual, Cash Value of the ... 224-225
Lime, Amount of, in Various Sugars and Syrups ... 243, 245, 246-7
Liquors, Intoxicating, Titles of acts Passed in 1881 to Prohibit Sale of, to Minors, Drunkards, etc ... 192, 194
Longevity, Average Increase of, does not Prove Increased Vitality of the Race ... 16-17
Loop, M. D., J. M., Weekly Reports of Diseases by, Compiled by Months ... 324, 327-50, 356-74
Lord, Hon. Henry W., Reference to Paper by, on Sanitary Rewards and Punishments ... 177
Luce, Hon. C. G., on Inspection of Every Barrel of Illuminating Oil ... 251
Ludington, Measures for Restriction of Diphtheria at ... lii
 Reports of Sickness at, in 1880, Compiled by Months ... 324, 344-74
Lunatics, concerning Care of, (*See Insane*) ... 227-9
Lundy, M. D., Prof. C. J., Reference to Paper by, on Light in the Public Schools, etc ... 176
Lung Diseases, Deaths from, in Mich. for each of the Years 1869-77, Diagrams ... 111
Lungs, Diseases of, cause nearly one-fifth of the Deaths in Mich ... 110
Lynn, Resolutions Commending Work of Sanitary Association of ... 241
Lyster, M. D., Henry F., Of Committee to Devise Plan for Regulation of Practice of Medicine ... xxxiv
 Member and Committee of State Board of Health, Postoffice Address, etc ... vii-viii, xxxv
 on Syphilis (The Great Pox) ... 195-200
 Paper, Plan of a Board of Health for Detroit ... 5, 54-61
 Questions at Examination in Sanitary Science in 1881 ... 235
 Reference to Papers by, in Annual Reports of this Board ... 175, 176, 177
 Requested to Attend Meetting of American Medical Association in 1881 ... xl
 Translations on Attenuation, Intensification, and Preservation of Charbon Virus, etc ... 201-204

M.

Mac Intyre, Prof. T., Invited Sanitary Convention to Institution for Deaf and Dumb ... 25-6, 53-4
 on Diphtheria at State Institution for Deaf and Dumb at Flint ... xlviii-xlix
Maiden, M. D., Wm. P., Weekly Reports of Diseases by, Compiled by Months ... 324, 326-42
Malaria, concerning Distance it may be carried by Winds ... 66
Malarial Fevers, Protection from, by Trees ... 40, 41, 63-5
Man an Arboreal Animal ... 69
Manchester, concerning Diphtheria and Pneumonia at, in 1881 ... lv
 Reports of Deaths and Sickness in, in 1880 ... 254, 258, 260, 283
Manistee, Reports of Sickness at, in 1880, Compiled by Months ... 324, 332-74
Maple Sugar, Pure, Consists almost Wholly of Cane Sugar ... 248
Maple Syrup, Analysis of Adulterated Sample of ... 248
Marine City, Burning of the, Might Have Been Prevented ... 99
Markle, John A., on Diphtheria in Sheridan township, Mecosta Co ... liv
Marquette, Av. Temperature at, by Months, in 1879, Diagram ... 115
 Meteorological conditions at, in 1880, Compiled by Months ... 404, 405, 414-67
 Reports of Sickness at, in 1880, Compiled by Months ... 324, 326-46
Marriage, Importance of Health Interests in ... 35
Marsh, M. D., W. R., Replies to Circular 40, Diseases in 1880 ... 275
 Weekly reports of Diseases by, Compiled by Months ... 324, 327-74
Marshall, M. D., O., Reference to Papers by, in Annual Reports of this Board ... 176, 177
 Weekly reports of Diseases by, Compiled by Months ... 325, 327-67
Marshall, Reports of Sickness at, in 1880, Compiled by Months ... 325, 328-75

PAGE.
Marshall, M. D., J., Report of a Poisoning by Eating Apple Jelly made in copper vessels.... lviii
  Replies to Circular 40, Diseases in 1880.... 278
Martin, Experiments by, in Inoculation of Tuberculous Matter.... 147
Martin, Dr. Henry A., 27 Dudley St., Boston, Mass., Propagates Bovine Vaccine Virus.... 292
Marvill, Lewis, Meteorological instruments intrusted to, Fiscal Year 1881.... xviii
Marysville, St. Clair Co., Successful Isolation and Disinfection in an Epidemic of Scarlet Fever at.... li
Masecar, M. D., A. J., Weekly reports of Diseases by Compiled by Months....325, 328-43
Mason, Reports of Sickness at, Compiled by Months....325, 327-59
Mattawan, Reports of Sickness at, in 1880, Compiled by Months....325, 328-67
Maudsley, Prof., On Depriving the Insane of their Liberty.... 229
Maxim, Dr. C. H., on Work of the Grand Rapids Sanitary Association....lxii, 75-7
McColl, M. D., H., Weekly reports of Diseases by, Compiled by Months....324, 327-74
McConnell, M. D., A. P., on Diphtheria at Ludington.... lii
  Weekly reports of Diseases by, Compiled by Months....324, 344-74
McCormick, Dr., Resolution by, for Uniform Laws to Prevent Venereal Diseases.... 239
McCoy, L., Vice-president Battle Creek Sanitary Convention.... 87
McGraw, M. D., Prof. T. A., on Program for Paper at Battle Creek Sanitary Convention.... 88
McLeod, M. D., Duncan, Reference to Paper by, on Ventilation of Dwelling-houses.... 178
McLouth, Prof. L., Meteorological Registers from, Compiled by Months....404, 422-441
Measles, Av. Order of Prevalence Where and When Present, Year and Months, 1880..315-19, 329-75, 377-79.
  Comparative Amount of Sickness in Michigan in 1880 Caused by....262-3, 312-13, 377-8, 401
  Diagram, Per cent of Weekly Reports of, by Months, in 1880.... 401
  Great Mortality of Children from, Preventable.... 7-9
  No. of Correspondents Reporting in Reply to Circular 40, by Months in 1880.... 262-3
  Per cent of Observers Reporting, by Months and Year, 1880....312-19, 379
  Per cent of Weekly Reports of, State and Divisions, Year and Months, 1880....315-23, 377-9, 401
  Per cent of Weeks Present Where Present, Year and Months in 1880....315-19, 329-75, 379
  Report on, at Somerset Center, Hillsdale Co.... liv
  Summary of Replies concerning No. of Cases of in Mich. in 1880.... 263-4
  Times Reported Usually or More or Less than Usually Severe in 1880.... 315-19
Measles and Scarlet Fever at Central Mine, Keweenaw Co.... liv
Meat, Bruised, in Chicago, made into "Canned Meat".... 68
  Communication of Consumption by.... 148-9
  Diseased, concerning Use of....24-5, 47-8
  Moderate Cooking does not Destroy Virus of Consumption in.... 149
Medical Practice, Regulation of, Elsewhere Drives Quacks into Mich.... 92
Medicine, Action of the Board relative to Regulating Practice of....xxxiii, xxxiv
Medicine, Dr. Emily Pope on Practice of, by Women in the U. S.... 228
Medicines of Unknown Composition Should Not Be Used.... 152-8
Medicines, Patent, Amount Consumed Annually, Cost, etc.... 152
Medicines, Patent, Why Injurious.... 157-8
Meetings of the Board, Abstracts from Proceedings at, Fiscal Year 1881....xxxiii-xlv
Members of State Board of Health, Addresses, Terms, etc....vii-viii, 90-1
Mendon, Av. Night Ozone at, by Months in 1878 and 1879, Diagrams.... 118, 120
  concerning Winter Cholera at, in 1881.... lx
  Meteorological conditions at, in 1880, Compiled by Months....404, 405, 414-66
  Reports of Deaths and Sickness in, in 1880....251, 259, 260, 283-4, 325, 328-75
  Report on Hog Cholera at....lviii-lx
Merrick, Wm. H., on Diphtheria in Hastings township, Barry Co.... l
Meteorological Characteristics of the Year 1880....412-3, 416
Meteorological Conditions in Mich. in 1880, Summary of Replies (to Circular 40) Concerning.. 270
Meteorological Conditions in Mich. in 1880, Explanations of Diagrams Relating to.... 411-12
Meteorological Conditions in Mich. in 1880, Compilation and Report.... 403-67
Meteorological Conditions and Coincident Sickness in Mich. in 1880....380-402, 427
Meteorological Instruments Loaned to Observers, and Returned, Fiscal Year 1881....xviii-xix
Meteorological Instruments, relative to Purchase of....xviii, xxxvii, xlii
Meteorological Observations, Directions for taking, and Care of Instruments.... 407-10
Meteorological Registers, Blank Form of.... 406
Meteorological Registers Received, Names and Localities of Observers, etc....xvi, 403-4
Meteorological Reports, Concerning Compilation of....114, 117, 411
Meteorology, Concerning the use of, in the Study of Causes of Diseases....114, 117, 411
Milford, Reports of Sickness at, in 1880, Compiled by Months....325, 328-75

PAGE.

Milk, Communication of Consumption by........ 149-150
Milk, Communication of Diphtheria by, in London........ 14
Miller, M. D., Carroll E., Weekly Reports of Diseases by, Compiled by Months........ 324, 326-9
Millponds, Overflowed Lands, etc., Protection against Ague from........ 41, 63-4, 65
Millspaugh, J. G., Report by, on Exhibit of Sanitary Appliances........ 188
Minong, Meteorological Conditions at, in 1880, Compiled by Months........ 404, 405, 414-42
Mitchell, Supt. I. N., Meteorological Registers from, Compiled by Months........ 404, 414-441
  on Sickness at Hastings in 1880........ 335
Mitchell, M. D., A., Replies to Circular 40, Diseases in 1880........ 275
Molasses, Sugars, and Syrups, Analyses of, by Prof. S. P. Sharples........ 242-8
Molasses, Sulphurous Acid and Sulphites used in Bleaching........ 245
Mold on Walls of Houses, Danger from........ 20-21
Money Value of a Human Life, Estimated........ 224-5
Montfort, M. D., I. N., Weekly reports of Diseases by, Compiled by Months........ 325, 327-43
Monroe, Reports of Sickness at, in 1880, compiled by Months........ 325, 328-75
Moore, Hon. John, Vice-president Flint Sanitary Convention........ 3, 30, 38
Mortality from Diphtheria in Institution for D. and D., Concerning Lightness of........ 72-4
Mortality-Statements Received from Health Officers, Registrars, etc., Fiscal Year, 1881........ xxix-xxx
Muir, Reports of Deaths and Sickness in, in 1880........ 254, 258, 260, 279, 325, 327-75
Mulheron, M. D., J. J., read a Paper on Disinfectants........ 68
Mulliken, M. D., W. W., on Small-pox, Diphtheria, and Scarlet Fever, at Escanaba........ liv
  Replies to Circular 40, Diseases in 1880........ 273-4
Mulvany, M. D., John, Reference to Paper by, on Ozone in Nature........ 177
Mulvany, Dr. John, Requested to Prepare Paper on *Post Mortem* Appearance, etc........ xxxix
Murray, V. S., A. J., wrote Letter on Collecting Vital Statistics of Animals........ xxxix
  Reference to Paper by, on Texas Cattle Disease........ 177
Museum of Hygiene, National, Resolution of Am. P. H. Ass'n for........ 241
Muskegon, Reports of Sickness at, in 1880, Compiled by Months........ 324, 326-74

N.

Nafe, G. W., on Diphtheria at Fremont Center........
National Board of Health, Action of, concerning Yellow Fever in 1880........ 240
  Asked to Restrict Importation of Small-pox by Immigrants........ xlii-xliii
  Requested to Continue Investigation of Diphtheria........ 240
National Museum of Hygiene, Resolution of American Public Health Association for........ 241
Navigation, Concerning Closure of in Lakes in 1880........ 415
Navy, U. S., 50 Per Cent of the Sickness in, in 1875-80 was from Syphilis........ 197
Newcomb. M. D., R. B. C., Weekly Reports of Diseases by, Compiled by Months........ 325, 357-75
Neuralgia, Av. Order of Prevalence Where and When Present, Year and Months, 1880........ 315-19, 329-75, 377-9, 393.
  Comparative Amount of Sickness in Michigan in 1880 Caused by........ 262-3, 312-13, 377-8, 390
  Diagram, Per Cent of Weekly Reports of, by Months in 1880........ 390
  Number of Correspondents Reporting, in Reply to Circular 40, by Months in 1880........ 262-3
  Per Cent of Observers Reporting, by Months and Year, 1880........ 312-19, 379
  Per Cent of Weekly Reports of, State and Divisions, Year and Months 1880........ 315-23, 377-9, 390, 393.
  Per Cent of Weeks Present Where Present, Year and Months in 1880........ 315-19, 329-75, 379
  Relations of, to Meteorological Conditions, by Months in 1880........ 393, 402
  Times Reported Usually or More or Less than Usually Severe in 1880........ 315-19
Nicholson, M. D., A. W., Relative to Meteorological instruments intrusted to, Fiscal Year 1881........ xix
  Meteorological Registers from, Compiled by Months........ 404, 405, 418-467
  on Dangers to Health Attending Pioneer Life........ 4, 38-43
  Reference to Papers by, in Annual Reports of this Board........ 176, 177
  Weekly Reports of Diseases by, Compiled by Months........ 325, 327-75
Nicholson, Mrs. M. M., Meteorological instruments intrusted to, Fiscal Year 1881........ xix
Nichols, M. D., A. W., Weekly Reports of Diseases by, Compiled by Months........ 324, 340-58
Nichols, Hon. E. C., Address of Welcome at Battle Creek Sanitary Convention........ 88, 89-90
  of Local Committee on Battle Creek Sanitary Convention........ 88
Niles, Av. Night Ozone at, by Months in 1878 and 1879, Diagrams........ 118, 120
  Meteorological Conditions at, in 1880, Compiled by Months........ 404, 414-64
  Reports of Deaths and Sickness in, in 1880........ 254, 258, 260, 280, 325, 328-75
Nirvana, Av. Night Ozone and Av. Temp. at, by Months in 1878 and 1879, Diagrams,........ 115, 118, 120
  Meteorological conditions at, in 1880, compiled by months,........ 404, 405, 414-66

PAGE.
Nirvana,—*Continued*,—
  Special Reports of Sickness at, in 1880, 331, 335
Nitrogenous Food, a Nerve Stimulant, concerning Force-value of 50-53
North, M. D., L. G., Meteorological instruments Intrusted to, Fiscal Year 1881 xviii, xix
Northeastern Division of Mich., Relative to Sickness and Meteorological Conditions in 311, 324, 326-74, 404, 418-66.
Northern-central Division of Mich., Relative to Sickness in, in 1880 311, 324, 326-74
Northern Division of Mich., Relative to Sickness in, in 1880 258, 260, 267-8, 274
Northville, Reports of Deaths and Sickness in, in 1880 255, 259, 260, 286, 325, 328-75
Northwestern Division of Mich., Relative to Sickness in, in 1880 311, 320-1, 324, 326-74
North Lansing, Reports of Sickness at, in 1880, Compiled by Months 325, 327-67
Nostrums, Composition of Various 153-60
Nostrum, Definitition of 152
Nostrums, Estimated Annual Consumption of 152-3
Nostrums, Evils from the Administration of, to Children, Dr. Crosby on 160-64
Nostrums in their Relations to Public Health, Prof. Prescott on 151-60
Nostrums, Poisonous Constituents of 156, 157
Notices of Communicable Diseases, Householders and Physicians Must Give 138, 205, 212, 295
Notices of Communicable Diseases, Indefiniteness of Law a Difficulty in Enforcing 181-4
Notice of Regulations, Local Boards of Health Must Give 302
Northrop, Rev., on Sale of Alcoholic Drinks 31
Northrop, M. D., George J., Weekly reports of Diseases by, Compiled by Months 324, 326-34
Northrup, M. D., J. I., Weekly reports of Diseases by, Compiled by Months 325, 369-71
Nuisances, Concerning Power of Local Boards of Health to Abate lii, liii
Nurses and Supplies, Board of Health May Provide, to Persons Restrained by them 300-1

O.

Occupations, Recreations, etc., Dr. Kellogg Committee on viii
Odorless Excavator, relative to work of, in Michigan xxxviii
Office of State Board of Health, Meteorological Conditions at, in 1880, compiled by Months, 404, 445, 418-67.
Oil, Illuminating, Interpretation of Law Relative to Inspection of 249-51
Oldfield, M. D., A. M., Weekly reports of Diseases by, Compiled by Months 324, 327-74
Oleomargarine, concerning Manufacture of 47, 48
Ophthalmia Prevalent in Treeless Countries 62
Opium-habit, Composition of Advertised Cures for 154-5
Opium-habit Formed in Children by Use of Cordials, Soothing-syrups, etc 160-2
Orange County, N. Y., Prevalence of Intermittent Fever in Dry Localities of 66
Organic Life, Lower Forms of, in relation to Decay 26-7
Organic Life Most Active during Forenoon 52-3
Organization, Sanitary, Worth of 187
Orr, M. D , George W., Weekly reports of Diseases by, Compiled by Months 324, 326-374
Otsego, Reports of Deaths and Sickness in, in 1880 254, 258, 260, 280-1, 325, 328-75
Otsego Lake, Reports of Deaths and Sickness in, in 1880 254, 274
Otisville, Av. Night Ozone and Av. Temp. at, by Months in 1878 and 1879, Diagram 115, 118, 120
Otisville, Meteorological Conditions at, in 1880, Compiled by Months 404, 405, 418-67
Otisville, Reports of Sickness at, in 1880, Compiled by Months 325, 327-75
Ovid, Reports of Sickness at, in 1880, Compiled by Months 325, 327-75
Oxygen, Attenuation of Charbon Virus, etc., by xliv, 201, 202, 203
Ozone and Coincident Sickness in Mich., by Months in 1880 380-402
Ozone at Lansing, Av. by Months at 3 Daily Observations in 1879 and 1880 453
Ozone, Day and Night, at Stations in 1880 and 1879, Compared by Months 452
  Day and Night at Agr'l College in 1880 and Previous Years, Compared by Months 447
  Day and Night, at Thornville, by Months in 1880 276, 448, 450
  Day at 24 Stations in Mich., by Months in 1880, Table and Diagram 448-9
  Formula for Preparing Schonbein's test-paper for 446
  Instruments and Directions for Observing 409
  Night at 24 Stations in Mich., by Months, in 1880, Table and Diagram 450-1
  Night, by Months in 1878 and 1879, at Each of 10 Stations in Mich., Diagrams 118, 120
  Observations at a Great Altitude in Colorado 446

P.

Packard, M. D., Nelson I., Weekly Reports of Diseases by, Compiled by Months 325, 328-47
Pain Killers, Composition of 153

PAGE.
Palmer, M. D., E. N., Weekly Reports of Diseases by, Compiled by Months 325, 328-75
Palmer, M. D., George C., Meteorological Registers from, Compiled by Months 404, 405, 414-67
Palmer, Thos. R., on Diphtheria at Arenac, Bay Co. 1
Papers in this Report, Authors Responsible for Statements in iv
Parker, Hon. LeRoy, of Local Committee for Flint Sanitary Convention 4
  on Need for Organization in Sanitary Work 141-2
  on the Importance of Systematic Study of Causes of Sickness 124-25
  on Sanitary Conventions as Securing Cooperation in Public Health work 141-2
  Reference to Papers by, in Annual Reports of this Board 175, 176, 177
  Paper on Legal and other Measures for the Prevention of Casualties 88, 95-102
  President and Committee of State Board of Health, Postoffice Address, etc. .... vii, viii, xl
  Questions at Examination in Sanitary Science in 1881 234
  Report on Exhibit of Sanitary Appliances at Battle Creek Sanitary Convention 188
  Recommendation of Bill to Exclude Contagious Diseases from School 230-1
  Report by, on Health Legislation in Michigan in 1881 191-4
  Report on Public Health Subjects before American Social Science Association 227-9
Parker, Thomas, A., Reference to Paper by, on Principles of Ventilation 177
Parmelee, F. D., Meteorological instruments intrusted to, Fiscal Year 1881 xviii
  Meteorological Registers from, Compiled by Months 404, 414-64
  on Sickness at Hillsdale in 1880 .... 331, 335, 347
Pasteur, L., on the Attenuation, Intensification, and Preservation of Charbon Virus, etc. xliv, 201-4
Patent Medicines, Amount Consumed Annually 152-3
  Composition of Various 153-60
  Should have their Composition on Labels 159-60
  Worthless Character of Large Classes of 153-8
Patterson, M. D., P. D., Weekly Reports of Diseases by, Compiled by Months 324, 327-88
Paw Paw, Reports of Sickness at, in 1880, Compiled by Months 325, 328-75
Peaches, Dr. Kedzie's Examination of Yellows in xxxvi
Peavy, C. C., of Local Committee on Battle Creek Sanitary Convention 88
Periodicals, Books, etc., Added to Library of the Board, Fiscal Year 1881 .... xix-xxvii
Personal Sanitary Responsibilities, Jno. K. Allen on 136-49
Peters, M. D., H., Meteorological instruments returned by, Fiscal Year 1881 xix
  Meteorological Registers from, Compiled by Months 404, 405, 414-67
  Reports Influenza and Epizootic in Tecumseh in Nov., 1880 371
Petoskey, Av. Night Ozone and Av. Temp. at, by Months in 1878 and 1879, Diagrams 115, 118, 120
  Reports of Deaths and Sickness in, in 1880 .... 254, 258, 260, 274
Phallus impudicus (?), Abundance of, near Reed City xlix
Physical Sciences, General Topics for Examinations in Sanitary Science 233
Physicians and Householders Must Give Notice of Communicable Diseases, Penalty ... 205, 212, 295-6
Physicians in Michigan, concerning Expenses for Services of 91
Physicians May Contribute Information Useful to Prevent Abortions 166
Physiology, Importance of Knowledge of 159
Pietra de Santa, Dr., on Work of the Mich. State Board of Health 124
Pine Floors, Relative to Decay Caused in, by a Fungus xxxv
Pioneer Life, Dr. A. W. Nicholson on Dangers from 38-43
Pioneer Life, Great Amount of Sickness in 42
Placards on Houses where there is Small pox, Diphtheria, or Scarlet Fever 205, 212, 296
Plague in London Exterminated by the Great Fire 27
Plastered Walls as a Means of Contaminating the Air of Rooms 19
Plymouth, Special Reports of Sickness at, in 1880 343
Pneumonia and Diphtheria, Report on, at Manchester, Mich. lv
Pneumonia, Av. Order of Prevalence Where and When Present, Year and Months, 1880 ..... 315-19, 329-75, 377-9, 383.
  Comparative Amount of Sickness in Michigan in 1880 Caused by 262-3, 308, 312-13
  Contagious Typhoid, as a Name for Hog Cholera lix
  Deaths from, in Mich., by Months, in Years 1871-4, Diagram 116
  Diagrams, Per cent of Weekly Reports of, in Mich., by Months in 1878 and 1879 .... 119, 121
  Diagram, Per cent of Weekly Reports of, by Months in 1880 308
  No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880 262-3
  Per cent of Observers Reporting, by Months and Year, 1880 .... 312-19, 379
  Per cent of Weekly Reports of, State and Divisions, Year and Months, 1880 .. 308, 315-23, 377-9, 383
  Per cent of Weeks Present Where Present, Year and Months in 1880 .... 315-19, 329-75, 379
  Relations of, to Meteorological Conditions 117-22, 383, 402
  Rheumatism, etc., More Prevalent after Removal of Forests 67

PAGE.
Pneumonia,—*Continued*,—
  Times Reported Usually or More or Less than Usually Severe in 1880.... 315-19
Poisoning by Eating Apple Jelly Made in Copper Vessels, Cases and Analysis of Jelly..xxxvi, lviii
Poisonous Wall Papers, Work of this Board relative to.... 171
Pokagon, Reports of Deaths and Sickness in, in 1880....254, 258, 260, 281
Polariscope, Use of, in Analyses of Sugars and Syrups 243-4, 245 246-8
Political Economy Demands Public Health Work.... 179
Pontiac, on Disinfection of Material Infected with Scarlet Fever at.... lv
  Spread of Small-pox at, by Infected Clothing.... xl
  Reports of Deaths and Sickness in, in 1880....255, 259, 260, 286-7, 325, 353-75
  Sanitary Association Formed at.... xl
  Summary of Meteorological Conditions at, by Months in 1880.... 287
Pontine Marshes, Spread of Ague by Cutting Away Trees Near.... 63-4
Poorhouses and Jails, Restriction of Contagious Diseases in.... 304
Poor-houses of Mich., Contributions by Preventable Sickness to....222-3, 224
Pope, Dr. Emily, on the Practice of Medicine by Women in the United States.... 228
Pork, Choleraic, concerning Sources of.... 47-8
Pork, Diseased, Sickness in Man Caused by, in England.... xliv
Porter, Midland County, Sickness and Deaths from Diphtheria at.... liv-lv
Port Huron, Great Number of Immigrants Arriving at.... xliii
  Meteorological Conditions at, in 1880, Compiled by Months....404, 405, 418-67
  Reports of Sickness at, in 1880, Compiled by Months....324, 327-74
Port Sanilac, Reports of Sickness at, in 1880, Compiled by Months....324, 327-50, 356-74
Postage Report, Fiscal Year, 1881.... xxxi
Practice of Medicine, Action of the Board relative to Regulation of....xxxiii, xxxiv
Practice of Medicine by Women in the United States, Dr. Emily Pope on.... 228
Pratt, M. D., Foster, Proposed Amendment by, to Contagious Diseases Law, Referred.... xlii
  on Sanitary Rules *versus* Medical Theories, Defects in Law Requiring Notices of Diseases....89, 179-84
Premises, Unsanitary, Evils of, Affect Neighbors and others.... 139
Prescott, M. D., Prof, A. B., on Medicinal Nostrums in Relations to Public Health....89, 151-160
  on Need for Organization in Sanitary Work.... 141
  on the Nature of Alcohol in Mixtures.... 135
  Reference to Paper by, on Use of Household Filters.... 176
Press, The, Aids Abortions by Advertising Drugs.... 165
Preventable Diseases, What Diseases Included under.... 221, 222
Preventable Sickness, Estimated Cost of, to the United States.... 224-226
Prevention and Restriction of Diphtheria, Document on.... 205-10
Prevention and Restriction of Scarlet Fever, Document on.... 211-18
Prevention and Restriction of Small-pox, Document on 289-304
Prevention rather than Cure, the Aim of Sanitary Work.... 90
Property of the Board, Secretary's Report relative to, fiscal year 1881....xviii-xxxii
Prostitution, concerning Government Regulation of 199-200
Publications of the State Board of Health, Resolution concerning Distribution of.... 70
Public Schools, Bill to Exclude Contagious Diseases from.... 230-1
  Grade Work of, Not Injurious to Pupils 78-83
Public Assemblies, concerning Law for Safety in.... 172
Public Conveyances, Disinfection of....209, 207-8, 217, 215-16
Public Health, Rev. J. Morgan Smith on Means of Promoting.... 185-8
Public Health Service, Dr. J. S. Billings on Obstacles to.... 237-8
Public Health Subjects before Am. Social Science Assn., Mr. Parker on.... 227-9
Public Health, Titles of Acts relating to, Passed by Legislature in 1881.... 191-4
Public Health Work, Need for Popular Interest in.... 138-9
Public Health Work, Need for State Aid in....107-8, 114, 124
Puerperal Fever, Av. Order of Prevalence Where and When Present, Year and Months, 1880 ....315-19, 329-75, 379
  Comparative Amount of Sickness in Michigan in 1880 Caused by....262-3, 312-13, 390
  Diagram, Per cent of Weekly Reports of, by Months in 1880.... 390
  No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880. 262-3
  Per cent of Observers Reporting, by Months and Year, 1880....312-19, 379
  Per cent of Weekly Reports of, State and Divisions, Year and Months, 1880....315-23, 379, 390
  Per cent of Weeks Present Where Present, Year and Months in 1880....315-19, 329-75, 379
  Times Reported Usually or More or Less than Usually Severe in 1880.... 315-19
Pulse More Rapid in Forenoon and After Eating.... 52

PAGE.
Pupils and Teachers in Mich., Bill to Secure Vaccination of.... 230-
Pupils, Average Ages of, in Different Grades of a Public School 80
Pupils, Ill-health of, Often Not Due to Overstudy.... 78-83
Putrefied Meat, concerning *post mortem* appearance of Decedents from Eating.... xxxix

Q.

Questions at the Examinations in Sanitary Science in 1881.... 234-6

R.

Race Deterioration, How it may be caused.... 16, 17
Ragweed in Full Bloom in Lansing, Aug. 20, 1880.... 359
Railroad Accidents, concerning Prevention of....96, 97-8, 102, 103
  No Life Lost by, in Michigan in 1877 and 1878.... 97
  Certain Provisions of Law against in Michigan.... 100
Railroad employees should be examined for Color-blindness.... 102
Railroads, more Perfect and Uniform System of Danger Signals needed for.... 102
Rain and Snow, Instruments and Directions for Observing and Recording.... 409
Rainfall, at 16 Stations in Mich., Year and Months, 1880. Table and Diagram....276, 444-5
Rainfall, Av., at 14 Stations in Mich. in 1880 and 1879, Compared by Year and Months.... 443
Rainfall, Decrease of, by Diminution of Woodland.... 67
Rainwater, Danger of Contamination of, by Ventilating-Shaft of Sewers.... 28-9
Randall, C. D., Reference to Paper by on Sewerage at the State Public School.... 177
Randall, M. D., Ira E., Lansing, Weekly Reports of Diseases by, Compiled by Months....324, 327-70
Ranney, Dr. Geo. E., Lansing, Sells Bovine Vaccine Virus.... 292
  Paper on the Health Service of a State....89, 169-79
Rash Fever, Canker Rash. Scarlet Rash, Scarlatina, Names for Scarlet Fever.... 211
Reducing Power of Sugars and Syrups as a Test in Analysis.... 243-4
Reed, M. D., W. F., Replies to Circular 40, Diseases in 1880.... 278
  Weekly Reports of Diseases by, Compiled by Months....325, 327-47, 357-74
Reed City, Facts Concerning Contagiousness of Diphtheria at.... li
  Meteorological Conditions at, in 1880, Compiled by Months....404, 405, 414-66
  Presence of a Fungus Coincident with Diphtheria and Typho-malarial fever at.... xlix
  Special Reports of Sickness at, in 1880....355, 363, 371, 375
Reeves, M. D., James S., Meteorological instruments intrusted to, Fiscal Year 1881....xviii-xix
  Meteorological Registers from, Compiled by Months....404, 414-464
  Weekly Reports of Diseases by, Compiled by Months....325, 328-75
Registration of Diseases and Deaths, Uniform and Complete, Importance of....238, 107-14
Regulations for Examinations in Sanitary Science by the Board.... 232-3
Reinstadler Propagated Bacteria of Consumption.... 143
Relation of Preventable Sickness to Taxation, Dr. Kellogg on.... 221-6
Remittent Fever, Av. Order of Prevalence Where and When Present, Year and Months in 1880....314-19, 326-73, 377-9
  Comparative Amount of Sickness in Michigan in 1880, Caused by....262-3, 312-13, 377-8, 400
  Diagram, Per Cent of Weekly Reports Stating Presence of, in Mich., by Months in 1879.... 113
  Diagram, Per Cent of Weekly Reports of, by Months in 1880.... 400
  No. of Correspondents Reporting in Reply to Circular 40, by Months in 1880.... 262-3
  Per Cent of Observers Reporting, by Months and Year, 1880....312-19, 379
  Per Cent of Weekly Reports of, State and Divisions, Year and Months, 1880....314-23, 377-9, 400
  Per Cent of Weeks Present Where Present, Year and Months, 1880....314-19, 326-73, 379
  Times Reported Usually or More or Less than Usually Severe in 1880.... 314-19
Reports to the State Board of Health, concerning the Compilation of....xvi, xvii
Reprints of Papers in Annual Reports, President and Secretary to Determine Number of.... xliv
Resolutions, Committees on, and Reports, at Sanitary Conventions....16, 69-70, 94, 188
Restriction and Prevention of Diphtheria, Scarlet Fever, and Small-pox, Documents on, 205-20, 289-304
Resuscitation of Drowned, Lives Saved by Document on.... 173
Revaccination, Necessity for.... 296-7
Reynolds, M. D., J. N., Weekly reports of Diseases by, Compiled by Months....324, 326-46
Rheumatism, Av. Order of Prevalence Where and When Present, Year and Months, 1880.... 315-19, 329-75, 377-9, 392.
  Comparative Amount of Sickness in Michigan in 1880 Caused by....262-3, 312-13, 377-8, 390
  Composition of Advertised Specifics for.... 157
  Diagram, Per cent of Weekly Reports of, by Months in 1880.... 390
  No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880.... 262-3
  Per cent of Observers Reporting, by Months and Year, 1880....312-19, 379
  Per cent of Weekly Reports of, State and Divisions, Year and Months. 1880..315-23, 377-9, 390, 392

PAGE.

Rheumatism,—*Continued*,—
  Per cent of Weeks Present Where Present, Year and Months, in 1880............315-19, 329-75, 379
  Relations of, to Meteorological Conditions, by Months in 1880............ 392, 402
  Times Reported Usually or More or Less than Usually Severe in 1880............ 315-19
  Pneumonia, etc., More Prevalent after Removal of Forests............ 67
Rice, S. C., On Diphtheria in Clio............ xlvii
Rich, Hon. John T., Vice-president Flint Sanitary Convention............ 3
Richardson, M. D., E. S., Meteorological instruments intrusted to, Fiscal Year 1881............xviii, xix
  Meteorological Registers from, Compiled by Months............404, 414-466
  on Contagiousness of Diphtheria............ li
  on Sickness at Reed City in 1880, etc............xlix, 355, 363, 371, 375
Riverius on Contagiousness of Consumption............ 143
Roberson, M. D., G. G., Weekly reports of Diseases by, Compiled by Months............325, 328-75
Rome, Lenawee Co., concerning Winter Cholera at in 1881............ lx-lxi
  Spread of Scarlet Fever, Prevented by Allowing no Public Funerals at liv
Romig, M. D., S. V., Weekly reports of Diseases by, Compiled by Months............325, 327-74
Root, M. D., W. W., Weekly reports of Diseases by, Compiled by Months............325, 327-59
Roscommon, Reports of Sickness at, in 1880, Compiled by Months............324, 332-74
Ross, Dr. E. J., on Suppression of Scarlet Fever at Rome, Mich............ liv
  On Winter Cholera in Rome township, Lenawee Co............ lx-lxi
Rouse, M. D., W. H., Reference to Paper by, on Neurasthenia............ 177
  Weekly reports of Diseases by, Compiled by Months............325, 328-75

S.

Sabin, M. D., Marden, Weekly reports of Diseases by, Compiled by Months............325, 328-75
Saginaw City, Reports of Sickness at, in 1880, Compiled by Months............324, 327-74
St. Johns, Reports of Deaths, Sickness, and Meteorological Conditions in, in 1880............254, 260, 279
St. Joseph, Reports of Sickness at, in 1880, compiled by months............325, 328-47, 365-75
Sanitarians Need Accurate Knowledge concerning Sickness and Death............ 107
Sanitary Apparatus, Regulations for Exhibition of, at Sanitary Conventions............ 3-4, 87-8
  Committees on, and Reports by Committees on, at Sanitary Conventions............16, 69-70, 94-5, 188
Sanitary Association at Grand Rapids, Reports Concerning............lxii, 75-7
Sanitary Association Formed at Pontiac............ xl
Sanitary Association of Lynn, Work of, Highly Commended............ 241
Sanitary Associations in Villages, Need for............ 178-9
Sanitary Associations, Local, Formation of, Recommended by Am. Public Health Assn............ 241
Sanitation, Cleanliness Essential to............ 185-6
Sanitary Conference at Chicago (1881), Action of, approved by This Board............xli, xlii
Sanitary Conventions, at Flint and Battle Creek, Announcements and Programs............3-5, 87-9
  Officers and Committees of............3, 4, 16, 69-70, 87, 88, 94-5, 188
  Proceedings and Addresses at Battle Creek............ 85-188
  Proceedings and Addresses at Flint............ 1-83
  Dr. Kedzie on Object of............ 6-9
  Hon. LeRoy Parker on Co-operation of Public Secured by............ 141-2
  Regulations for Exhibition of Apparatus at............3-4, 87-8
Sanitary Detective, Recommendation of a............ 188
Sanitary Duties, Personal, concerning............ 136-41
Sanitary Engineer, concerning Duties of, in a City Board of Health............ 56-57
Sanitary Engineering, General Topics for Examinations in Sanitary Science............ 233
Sanitary Inspection, General Topics for Examinations in Sanitary Science............ 233
Sanitary Knowledge, Public Need of............5, 9, 11, 12, 15
Sanitary Law, General Topics for Examination in Sanitary Science............ 233
Sanitary Measures, Great Benefits from certain, in India............ 12-14
Sanitary Police Measures, Importance of............ 44-5
Sanitary Progress Involves Great Expense............ 186
Sanitary Progress, Superstition a Main Barrier to............ 169-70
Sanitary Publications, Committees and Reports on, at Sanitary Conventions............16, 70, 95
Sanitary Rules *versus* Medical Theories, Dr. Pratt on............ 179-84
Sanitary Science Examinations by the State Board of Health, Amendments to Regulations for xliv
  Regulations, and Questions in 1881............ 232-36
  Certificate for Proficients in, Adopted............ xxxiii
  Fee for, and Use of Fees............xxxix, xliv
  Postponed from July to October, 1881............ xliv
  Ten Questions to be Answered in Writing at, for each Member of the Board............ xxxix
  To be held the Second Tuesday in July............ xxx

PAGE.
Sanitary Science, Need for State Lecturer on, in Mich. 187–8
  State, National, and Local aid Necessary for much Progress in 107
  What Constitute Contributions to 110–11
Sanitary Supervision of Dwellings, Importance of 59–60
Sanitary Surveys, Importance of Having 59–60, 238
Sanitary Survey, Rev. Jacokes, Mr. Parker, and Dr. Baker Committee on viii
Sanitary System, Value of Judicious Investments in a 186
Sanitation and Christianity, Rev. Chas. H. W. Stocking on 31–8
Sanitation Dependent on Heredity 17, 35
Sanitation, Domestic, Dr. J. H. Jerome on 44–9
Sanitation, Domestic, Dr. J. H. Kellogg on 16–25
Sanitation Involves Education, Inspection, and Construction 186
Sanitation, General Remarks on Importance and Means of 5–6, 9–12, 15, 139–140
Sanitation, Prevention rather than Cure the Aim of 90
Sanitation, Public, Advanced by the War of the Rebellion 178
Sanitation, Public, May Increase Av. Longevity and Not Vitality, of a Race 16–17
Sawyer, M. D., A. I., Weekly reports of Diseases by, Compiled by Months 325, 345–75
Scarlatina, Scarlet Rash, Canker Rash, Rash Fever, Names for Scarlet Fever 211
Scarlet Fever and Diphtheria Documents, Boards of Health Recommended to Distribute, Prices, etc. 210, 218
Scarlet Fever and Diphtheria, Virus of, May Live a Long Time 209, 211
Scarlet Fever and Measles at Central Mine, Keweenaw Co. liv
Scarlet Fever, Comparative Amount of Sickness in Michigan in 1880 Caused by 262–3, 312–13, 401
  Av. Order of Prevalence, where and When Present, Year, and Months, 1880 315–19, 329–75, 379
  Causes of Spread of, at South Blendon, Ottawa Co. lii
  Communication of, by a Dwelling-house 60
  Diagram, Per cent of Weekly Reports of, by Months in 1880 401
  Document on Restriction and Prevention of (ordered Translated xl) 211–18
  Incubation Period of 211
  Great Mortality of Children from, Preventable 7–9
  How to Avoid and Prevent, Special Directions 217–18
  Legislation Urged Making it a Crime to Give 239
  Measures Employed to Disinfect Material Infected with, at Pontiac lv
  Scarlet Fever, Methods of Disinfection Relative to 215–16
  One of the Most Contagious of Diseases 211
  No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880 262–3
  Per cent of Observers Reporting, by Months and year 1880 312–19, 379
  Per cent of Weekly Reports of, State and Divisions, Year and Months, 1880 315–23, 379, 401
  Per cent of Weeks Present where Present, Year and Months in 1880 315–19, 329–75, 379
  Public Safety Should Have Benefit of Doubt in Diagnosis of 240
  Relative Prevalence in Mich. in 1880 and Previous Yrs., Summary 256–61
  See "Diphtheria, Scarlet Fever, Smallpox, etc.," "Contagious Diseases," and "Diseases Dangerous."
  Successful Isolation and Disinfection in an Epidemic of, at Marysville li
  Summary of Replies concerning Communication of, in Mich. in 1880 264, 271
  Summary of Replies concerning No. of Cases of, in Mich., in 1880 263
  Suppression of, in Rome, Lenawee Co. liv
  Times Reported Usually or More or Less than Usually Severe in 1880 315–19
  Work of this Board for Restriction and Prevention of 173
Schools, Diseases Spread by, in Mich., in 1880 264, 273–87
Schools, Public, Bill to Exclude Contagious Diseases from 230–1
Schools, Public, Vaccination Should be Required before Admission to 230–1, 294
Schoolwork of Public Schools, Fatigues Mostly the Over-ambitious 81
  Hours per Day Required for 80–81
  Many Pupils Ask for an Increase of 81
Schoolwork of Pupils Often Not so Fatiguing as Their Outside Work 81
Schuller Propagated Bacteria of Consumption 143
Scott Nonesuch Chimney Cap and Ventilator, Recommendation of 69, 188
Scrofula, Its Relation to Syphilis 196
Seal for the State Board of Health, Report of Design of, Adoption and Purchase xxxv, xxxvii, lxi–lxii.
Secretary's Report of Property of the Board, Fiscal Year 1881, and Approval of xviii–xxxii
Secret Remedies, Dangerous Character of 153–8
Sekell, A. C., Reference to Paper by, on Sewerage of the City of Grand Rapids 177
Sewerage and Drainage, Distinct Operations, Defined 26

PAGE.

- Sewerage and Drainage, Dr. Lyster Committee on ... viii
- Sewerage and Its Adjuncts, Daniel Clark, M. D., on ... 26-9
- Sewerage-appliances, Report by Committees on, at Sanitary Conventions ... 69, 188
- Sewer-traps, concerning Ventilation of ... 28-9, 30, 69
- Seymour, M. D., H. P., on Typhoid Fever, Water filters, etc. ... 44
- Sharples, Prof. S. P., Analyses of Sugars and Syrups by, Vote of Thanks to ... xxxvi, xxxix, 242-8
- Shearer, Hon. James, Vice-president Flint Sanitary Convention ... 3
- Sheridan Township, Mecosta Co., Diphtheria at ... liv
- Sickness and Coincident Meteorological Conditions in Mich., by Months in 1880 ... 380-402, 427
- Sheriffs, Relative to Services of, in Suppression of Contagious Diseases ... 301, 303-4
- Sickness in Michigan, Estimate of Annual Expenses for ... 91
  - in 1880, Compared with Previous Years ... 255, 273-88
  - Most in Aug., and Least in May and Nov., in 1880 ... 391, 427
- Sickness, No. of Persons who Seek State and County Aid on Account of, in Mich. ... 222-3
  - Preventable, Annual Cost of, Rapidly Increasing ... 225
  - Preventable, Dr. Kellogg on Relation of, to Taxation ... 221-6
  - Preventable, Estimated Annual Cost of, in Mich., and the United States ... 224-6
  - Prevention of, Better and Easier than Cure ... 11-12, 14
  - Two Years of, per Death in English Benefit Societies ... 225
  - Value of Reports of ... 107-10, 112-14, 117, 122
- Sill, Supt. J. M. B., Reference to Paper by, on School Hygiene ... 177
- Simonson, M. D., A. B., Meteorological instruments intrusted to, Fiscal Year 1881 ... xix
  - Meteorological Registers Received from, Compiled by Months ... 404, 414-41
- Simpson, M. D., Irwin, Weekly Reports of Diseases by, Compiled by Months ... 325, 328-75
- Skin-maladies Prevalent in Treeless Countries ... 63
- Skinner, T. B., of Local Committee on Battle Creek Sanitary Convention ... 88
- Sleep, From 7 to 9 Hours Daily Required by All ... 140
- Sleeping-rooms, in Most Houses, too Small ... 20
- Small-pox, A Preventable Disease ... 289
  - Av. Order of Prevalence Where and When Present, Year and Months, 1880 ... 315-19, 329-75, 379
  - Brought to Localities in Michigan by Immigrants ... xl, liv, xlii-xliii
  - Causes less Deaths in Mich. than does Whooping-cough ... 110
  - Communicated by Imperfectly Disinfected Clothing ... xl-xli
  - Comparative Amount of Sickness in Michigan in 1880 Caused by ... 262-3, 312-13, 390
  - Concerning Origin of ... 203
  - Deaths from, before and after Introduction of Vaccination ... 170, 290
  - Diagram, Per Cent of Weekly Reports of, by Months in 1879 and 1880 ... 120, 390
  - Disfigurements of the Body by ... 289
  - Document on Prevention and Restriction of, also Distribution, Price, Translation, etc., of Document ... xl, 289-304
  - Duties of Health Officers and Boards of Health in Prevention and Restriction of ... xliii, 299-304
  - Householders and Physicians must Give Notice of, Under Penalty for Neglect ... 205, 212, 295
  - In Detroit Checked by Vaccination ... xliv
  - Legislation Urged Making it a Crime Knowingly to Give ... 239
  - Near Greenville, Report of Cases of ... xli
  - Not Spontaneously Generated ... 294
  - No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880 ... 262-3
  - Patients, Who May Attend ... 296-7
  - Penalty for Inoculation with, Except at a Hospital ... 299
  - Per cent of Observers Reporting, by Months and Year, 1880 ... 312-19, 379
  - Per cent of Weekly Reports of, State and Divisions, Year and Months, 1880 ... 315-23, 379, 390
  - Per cent of Weeks Present Where Present, Year and Months in 1880 ... 315-19, 329-75, 379
  - Practically Suppressed in Michigan ... 123
  - Public Safety Should Have Benefit of Doubt in Diagnosis of ... 240
  - Resolutions to Prevent Importation of, by Immigrants ... xlii-xliii
  - See "Diphtheria, Scarlet Fever, Small-pox, etc." "Contagious Diseases," and "Diseases Dangerous."
  - Summary of Replies concerning No. of Cases of, in Mich., in 1880 ... 261-2
  - Times Reported Usually or More or Less than Usually Severe in 1880 ... 315-19
  - The Am. Public Health Assn. Urge Vaccination to Prevent ... 239-40
  - Vaccination for, concerning (See Vaccination) ... 170, 290, 239-40, 289-95
  - When Most Prevalent ... 294-5, 121, 390
  - Work of this Board for Restriction and Prevention of ... 173-74
- Smart, M. D., A. R., Replies to Circular 40, Diseases in 1880 ... 282-3
  - Weekly Reports of Diseases by, Compiled by Months ... 325, 333-5, 341-3, 353-75

PAGE.

Smiley, M. D., Jas. F., Weekly reports of Diseases by, Compiled by Months...325, 345-75
Smith, Rev. J. Morgan, on Imagination in Relation to Cures... 164
  on the Relation of the Clergy to Criminal Abortion... 167
  Paper on Means of Promoting the Public Health...89, 185-8
  Reference to Paper by, on Duty of the Christian in respect to the Laws of Health... 176
Smith, M. D., I. N., Condemns Public Funerals of Decedents from Contagious Diseases... 25
  on Location of Dwellings... 44
  Resolution on Need for a Board of Health in Detroit... 68
  Weekly reports of Diseases by, Compiled by Months...324, 368-74
Smith, M. D., R. B., Replies to Circular 40, Diseases in 1880... 279-80
  Weekly Reports of Diseases by, Compiled by Months...325, 327-75
Smith, M. D., W. H., Report of successful isolation and disinfection of Scarlet Fever... 11
Soda, Chlorinated, use of as a Disinfectant...207, 214
Soil-moisture in Mich., by Months in 1880, Summary of Replies Concerning... 267
Solomonsen, Experiments by, in Inoculation of Tuberculosis... 145-6
Somerset Centre, Hillsdale Co., Concerning Measles at... liv
Sore Throats, Persons Having, More Liable to Diphtheria, Scarlet Fever, etc... 209, 217
Sound Body Necessary to a Sound Mind... 93
Southard, M. D., W. B., Weekly Reports of Diseases by, Compiled by Months...325, 328-75
South Blendon, Ottawa Co., Special Report of Scarlet Fever at... lii
South Haven Township, Diphtheria Spread in, because not believed to be Contagious... l
Southeastern Division of Mich., Relative to Sickness and Meteorological Conditions in, in 1880...259-260, 267, 269, 286-8, 311, 323, 325, 326-75, 378-9, 404, 418-66
Southern-Central Division of Mich., Relative to Sickness and Meteorological Conditions in, in 1880...258-9, 260, 267, 269, 281-6, 311, 323, 325, 326-75, 378-9, 404, 418-66
Southwestern Division of Mich., Relative to Sickness and Meteorological Conditions in, in 1880...258, 260, 267, 269, 280-1, 311, 322-3, 325, 326-75, 378-9, 404, 437-66
Spanish Peninsula, Fevers Prevalent in, though it is dry... 65-6
Special Investigations Concerning Diphtheria, Typhoid fever, Consumption, Intermittent fevers, etc., Need for...123, 124, 187
Spencer, Prof. Z. C., Vice-president Battle Creek Sanitary Convention... 87
Spotted Fever, a Preventable Disease... 222
Starch Sugars and Syrups, Analyses of, by Prof. S. P. Sharples... 242-8
Starchy Food, concerning Force-value of... 50, 51
State Board of Health, Members of, How Appointed, Term, etc...vii, viii, 90-91
  Papers in Annual Reports of, with Authors... 175-8
  relative to Work of, Press Comments, etc. ...108-24, 171-8, 189-90
  Resolution concerning Distribution of Publications of... 70
State Boards of Health, Secretary to Present Summaries of Work of... xlv
State House of Correction, Ionia, Meteorological conditions at, in 1880,...404, 422-64
  Reports of Deaths and Sickness in, in 1880...254, 258, 260, 278
State Lecturer on Hygiene, Need for... 187-8
State Medicine, Advances made in... 189
State Normal School, Ypsilanti, Meteorological conditions at, in 1880...404, 422-42
State Oil Inspector, on the Testing of Every Barrel of Oil... 251
State, Personal Sanitary Duties to... 136-38
State Public School, Coldwater, Meteorological conditions at, in 1880, Compiled by Months, 404, 422-64
Stationery-Report of this Board, Fiscal Year, 1881...xxx-xxxi
Steamboat Accidents, Concerning Prevention of...96, 97, 98-9, 102, 103
Steamboat Inspection, Laws of the U. S., Concerning Requirements of... 100
Steamboats, Bill for Inspection of, in Mich., Prepared by Mr. Parker and Defeated...xxxvii, xliv
Steam-boilers, a Complete System of Inspection of, should be required... 102
  170 Explosions of, in the U. S. in 1880, 259 Persons Killed, etc... 102
Steam Craft, Inspection of Boilers and Hulls of, Necessary... 102
  No Life Preservers, etc., required to be carried on, in Mich... 102
Stephenson, M. D., Robert, Weekly reports of Diseases by, Compiled by Months...325, 361-75
Stephenson, M. D., A. M., Weekly reports of Diseases by, Compiled by Months...325, 328-59
Stevens, M. D., L. S., Replies to Circular 40, Diseases in 1880... 279
  Weekly reports of Diseases by, Compiled by Months...325, 327-75
Stewart. M. D., Edwin, Meteorological Registers from, Compiled by Months...404, 405, 414-466
  on Winter-cholera at Mendon... lx
  Weekly reports of Diseases by, Compiled by Months...325,328-75
Stimulants should not be taken at Breakfast... 53
Stink-horn (?) Fungus, Abundance of, near Reed City... xlix
Stocking, D. D., Rev. Chas. H. W., on Relations of Sanitation to Christianity...4, 31-8

PAGE.
Stockwell, M. D., G. A., Weekly reports of Diseases by, Compiled by Months.................324, 327-54
Stoddard, M. D., John P., Weekly Reports of Diseases by, Compiled by Months.............324, 332-54
Stowel, Henry, Report on Diphtheria in Bunkerhill township, Ingham Co.................xlv, xlvi
Stratton, M. D., R. F., Weekly reports of Diseases by, Compiled by Months...........325,328-47, 36575
Strong, Prof. E. A., member and Committee of the State Board of Health.................. xxxv
of Committee on Sanitary Conventions.. 4, 88
Reference to Paper by, on Health of the Young, as Affected by School Architecture, etc. 176
Study not the cause of All Sickness of Pupils.. 78-83
Sturgis, Reports of Sickness at, in 1880, Compiled by Months..............................325, 328-47
Sugar House Syrup, Average Composition of.. 242
Sugar, Pure Maple, Consists almost Wholly of Cane Sugar................................... 248
Sugar, Reducing Power of, no Test of Adulteration... 245
Sugars and Syrups, Analyses, and Explanations of Analyses of, by Prof. S. P. Sharples..... xxxvi, 242-8.
Sulphur, Use of as a Disinfectant in cases of Contagious Diseases..........207, 208, 215-16, 220, 297, 298
Sulphuric Acid, Amount of in Various Sugars and Syrups....................................243, 245, 246-7
Sulphurous Acid, Use of in Refining Sugars.. 245-247
Sunshine, Number of Days of, at Thornville, by Months in 1880.............................. 276
Supplies and Nurses, Boards of Health may Provide, to Persons Restrained by them 300-1
Sutton, J. P., on outbreaks of Diphtheria and Smallpox at Cheboygan......................... li
Swamp Lands, Titles of Acts for Reclamation of, Passed by Legislature in 1881............... 191-4
Swamps and Dwellings, Trees Should Stand between... 41, 43
Sweden, Deaths from Small-pox in, Before and After Introduction of Vaccination.............. 290
Sweet, Fred., Meteorological instruments intrusted to, Fiscal Year 1881.................... xviii
Meteorological Registers from, Compiled by Months...404, 414-441
Swift, M. D., J. M., Replies to Circular 40, Diseases in 1880............................... 286
Weekly reports of Diseases by, Compiled by Months...325, 328-75
Sympathetic and Cerebro-spinal nerves, Physiology of....................................... 128, 129
Syphilis, A Theory of Origin of... 203
Syphilis Among the Poor Admitted to Public Institutions..................................... 197
and Consumption, Resemblances between.. 146
Causes and Complicates Scrofula, Consumption, etc..195, 196, 198-9
Communicated to Those Innocent of Illicit Intercourse....................................... 198, 200
Geographical Distribution, Early History, and Great Prevalence of........................... 195-8
Concerning Legal Enactments to Restrain Spread of... 199
Definition, Description, Symptoms, and Effects of...195, 198-9
Inherited, Characteristics and Effects of.. 198-9
May be Checked by Regulating Prostitution.. 199-200
Proportion of Conscripts Rejected for, by Occupations, U. S. Army 1863-5.................... 196
Relation of Occupations to.. 196
Report on, by Prof. Lyster.. 195-200
The first Noted Epidemic of, occurred in Italy.. 197-8
Syrups and Sugars, Analyses, and Explanations of Analyses of, by Prof. S. P. Sharples, xxxvi, 242-8
Systematic Study of the Causes of Sickness and Deaths....................................... 107-25

T.

Table Syrups, Review of Dr. Kedzie's Paper on Adulteration of............................... 171-2
Taft, M. D., H. S., Weekly reports of Diseases by, Compiled by Months.......................324, 332-46
Taxation, Dr. Kellogg on Relation of Preventable Sickness to.................................viii, 221-6
Taylor, Dr., U. S. A., Addressed Flint Sanitary Convention................................... 68
Taylor, M. D., A C., on Diphtheria and Pneumonia at Manchester............................... lv
Replies to Circular 40, Diseases in 1880.. 283
Tea and Coffee Not Suitable for Breakfast.. 53
Teachers and Pupils, Bill to Secure Vaccination of, in Mich.................................. 230-1
Teachers of Public Schools Not Devoid of Interest in Health of Pupils........................ 79, 140
Tecumseh, Av. Temp. and Av. Night Ozone at, months in 1878 and 1879, Diagrams...........115, 118, 120
Reports of Deaths and Sickness in, in 1880.................................. 254, 259, 260, 284, 371
Temperature and Coincident Sickness in Mich., by Months in 1880..............258-60, 265, 380-402, 427
Av. at 15 Stations in 1880 and at 19 Stations in 1879 Compared by Months...................... 417
Av. at the Agrl. College in 1880 and 16 Previous Years, Compared by Months..................413, 416-7
Av. by Months in 1879, at 12 Stations in Michigan, Diagram.................................... 115
Av. by Months in 1880 at 15 Stations in Mich., Tables and Diagrams.....................276, 405, 418-20
Av. Daily Range at the Agrl. College in 1880 and Previous Years, Compared by Months.. 421
Av. Daily Range at 12 Stations in 1880 and at 6 Stations in 1879, Compared by Months...... 424

PAGE.
Temperature and Coincident Sickness in Michigan,—*Continued*,—
Av. Daily Range, by Months in 1880, at each of 12 Stations, Table and Diagram........ 425-6
Extremes and Range 1880 and 7 Previous Years, at Agrl. College, Compared by Months. 421
Extremes by Months and Year, and Range for Year, at each of 28 Stations........276, 422-3
Instruments and Directions for Observing........ 407
In Mich. in 1880, General Remarks Relating to........412, 414-15, 416, 424
Less Equable after Removal of Forests........ 67
of Water in Cedar River in Oct., for Years 1874-80........ 416
Thompson, M. D., A. A., Committee on Resolutions, report........16, 69-70
Thompson, Rev. C. J., Condemns Public Funerals of Decedents from Contagious Diseases.. 25
Thornville, Meteorological Conditions at, in 1878-9-80, Compiled by Months, 118, 120, 276, 404, 405, 414-67
Reports of Sickness in, in 1880........258, 260, 275-7, 324, 327-74
Three Rivers, Reports of Deaths and Sickness in, in 1880........255, 259, 260, 284
Reports of Sickness at, in 1880, Compiled by Months........284, 262-3, 325, 328-75
Tibbals, M. D., E. P., Weekly reports of Diseases by, Compiled by Months........324, 327-42
Tonsilitis, Comparative Amount of Sickness from, in Mich. in 1880........262-3, 312-13, 377-8, 382
Av. Order of Prevalence Where and When Present, Year and Months, 1880,........315-19, 329-75, 377-9, 388.
Diagram, Per Cent of Weekly Reports of, by Months in 1880........ 382
No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880........ 262-3
Per Cent of Observers Reporting by Months and Year, 1880........312-19, 379
Per Cent of Weekly Reports of, State and Divisions, Yr. and Mos., 1880,......315-23, 377-9, 382, 388
Per Cent of Weeks Present Where Present, Year and Months in 1880........315-19, 329-75, 379
Relations of, to Meteorological Conditions, by Months in 1880........ 388, 402
Times Reported Usually or More or Less than Usually Severe in 1880........ 315-19
Tonsils, Cases of Inflammation of, Preceded Diphtheria at Institute for Deaf and Dumb.... 71
Topping, M. D., G. W., Replies to Circular 40, Diseases in 1880........ 277
Report of Prosecution for Selling Glandered Horses........liii-liv
Weekly Reports of Diseases by, Compiled by Months........324, 327-74
Tornadoes More Frequent after Removal of Forests........ 67
Travelers, Boards of Health May Restrain, to Prevent Contagious Diseases........ 302-3
Traverse City, Reports of Sickness at, in 1880, Compiled by Months........324, 326-9
Treeless Countries, Diseases of Eyes and Skin Prevalent in........ 62, 63
Trees and Forests as Sanitary Factors, Dr. Caulkins on........ 61-8
Trees near Dwellings, concerning Advantages of........ 41-2, 43
Trees, Protection from Fevers by........40, 41, 63-5, 66
Trenton, Reports of Sickness at, in 1880, Compiled by Months........325, 328-75
Tubercles from non-tuberculous matter not infectious........ 147
Tubercle, See *Consumption*.
Turner, Harry B., Meteorological Registers from, Compiled by Months........404, 405, 418-467
Turner, Hon. James M., Vice-president Flint Sanitary Convention........ 3
Tyndall, Rev., Advises Frequent and Thorough Bathing........ 25
on Water-supply........ 44
Typhoid Fever, Communication of, by That Historic Calf........ 24-5
Av. Order of Prevalence Where and When Present, Year and Months, 1880........314-19, 329-75
Comparative Amount of Sickness in Mich. in 1880, Caused by........262-3, 312-3, 400
Diagrams, Per Cent of Weekly Reports of, by Months in 1879 and 1880........ 113, 400
Need for Special Investigation of........ 123
No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880........ 262-3
Per Cent of Observers Reporting, by Months and Year, 1880........312-19, 379
Per Cent of Weekly Reports of, State and Divisions, Year and Months, 1880........314-23, 379, 400
Per Cent of Weeks Present Where Present, Year and Months in 1880........314-19, 329-75
Summary of Replies concerning No. of Cases of, in Mich. in 1880........ 263
Times Reported Usually or More or Less than Usually Severe in 1880........ 314-19
Typho-malarial Fever, Comparative Amount of Sickness from in Mich. in 1880, 262-3, 312-13, 377-8, 400.
Av. Order of Prevalence Where and When Present, Year and Months, 1880...314-19, 329-75, 377-9
Diagrams, Per cent of Weekly Reports of, by Months in 1879 and 1880........ 113, 400
Near Reed City Coincident with Presence of Certain Fungus........ xlix
No. of Correspondents Reporting, in Reply to Circular 40, by Months, in 1880........ 262-3
Per cent of Observers Reporting, by Months and Year, 1880........312-19, 379
Per cent of Weekly Reports of, State and Divisions, Year and Months, 1880......314-23, 377-9, 400
Per cent of Weeks Present Where Present, Year and Months in 1880........314-19, 329-75, 379
Times Reported Usually or More or Less than Usually Severe in 1880........ 314-19

PAGE.

U.

Union City, Reports of Deaths and Sickness In, in 1880 ..... 255, 259, 260, 284-5, 325, 328-75
  Summary of Meteorological Conditions at, by Months in 1880 285
U. S. Signal Service Stations in Mich. Reporting to State Board of Health 403, 404
University of Mich., Ann Arbor, Meteorological Conditions at, in 1880, Compiled by Months, 404, 414-64
Upper-Peninsular Division of Mich., Sickness and Meteorological Conditions In, 258, 260, 267-8, 273-4, 311, 320-1, 324, 326-74, 404, 418-66.
Urine and Urea, Excretion of, Generally Greatest in Forenoon 52-3
Utica, Reports of Sickness at, in 1880, Compiled by Months 325, 328-75

V.

Vaccination A Preventive of Small-pox 219, 239-40, 289-90
Vaccination, All Attendants on Small-pox Patients Should be Vaccinated 296
  Appearances after, and Signs of Successful Vaccination 293
  Deaths from Small-pox before and since Introduction of 290
  Free, Local Boards of Health Should Frequently Offer, Law Authorizing, etc. ..... lii, 174, 301
  Necessity for Revaccination 296-7
  Of Immigrants, Resolutions Urging ..... xlii-xliii
  Of Pupils and Teachers, Bill to Enforce, in Mich. 230-1
  Restriction of Small-pox by, in Detroit xliv
  Should be Required before admission to Public Schools 230-1, 294
  Urged by Am. Pub. Health Association as the Preventive of Small-pox 239-40
  When, Why, Where, How, by Whom, and with What to be Vaccinated 289-94
  Who Should and who Should not be Subjected to 290
  Work of this Board to Secure in Michigan 173-4
Vaccine Virus, Bovine, where to obtain 292
  Reasons for Preferring Bovine to Humanized 291
VanAntwerp, M. D., S. C., Replies to Circular 40, Diseases in 1880 285
Van Riper, Hon. J. J., on Necessity for Testing every Barrel of Illuminating Oil 250
Vander Veen, M. D., A., Weekly reports of Diseases by, Compiled by Months 334, 326-74
Vapor of Water, Amounts Inhaled and Exhaled Daily, and Relations of, to Coincident Sickness 380-402, 426-7
Vaughan, Prof. V. C., Gave Rules for Determining Quality of Meats 25
  on use of Alcohol and on Alcohol as a Food 31, 135-36
  on Use of Cistern or Well Water 44
  Paper on Force Value of Foods 5, 49-53
  Reference to Paper by, on Contamination of Drinking-water 176
Velocity of Wind and Coincident Sickness in Mich., by Months in 1880 380-402
Veenboer, M. D., Melle, Passed Examination in Sanitary Science xxxv
  Reference to Paper by, on Prevention Better than Cure 177
Venereal Diseases, Legislation urged Making it a Crime to Give 239
Venereal Diseases, See Syphilis.
Venereal Diseases, 12,341 Persons Treated for, at Public Institutions, in N. Y. City in 1873 199
Venning, Rev. James, Condemns Public Funerals for Decedents from Contagious Diseases, 25
Venning, Rev. James, of Local Committee for Flint Sanitary Convention 4
Ventilating Apparatus, Reports by Committees on, at Sanitary Conventions 69, 188
Ventilation, Heating, etc., Rev. D., C. Jacokes Committee on viii
Ventilation, Importance of, in Restriction of Contagious Diseases 67, 216, 299-300
  Report by Committee on, at Flint Sanitary Convention 69
Vernon, Reports of Sickness at, in 1880, Compiled by Months 325, 327-59
Vicksburgh, Kalamazoo Co., Report on Hog Cholera at ..... lviii-lx
Vicksburgh, Reports of Deaths and Sickness in, in 1880 ..... 255, 259, 272, 285
Villemin Demonstrated that Tuberculosis is Inoculable 143
Virus, Attenuation of, and its Return to Virulence ..... xliv, 201-3
Vital Statistics, Dependence of Public Health Work on 107-14, 238
  Imperfections of, a Hindrance to Public Health Work 238, 107-24
  of Animals, Letter Relative to Collection of, Referred xxxix
  of Mich., Useful Facts from 110-12
  need to be co-ordinated with other knowledge 108-9
Voorhees, M. D., G. V., Weekly reports of Diseases by, Compiled by Months 325, 328-43
Voute, C. H., Reports on Work of an Odorless Excavator in Michigan xxxviii

W.

Walbridge, Edward L., Report of a Prosecution for Selling Glandered Horses ..... liii-liv
Wall-papers, Window-curtains, etc., Arsenical Contamination of Air by 23

PAGE.

Wappenhans, Sergt. C. F. R., Meteorological Registers from, Compiled by Months....404, 405, 422-64

Wardell, M. D., J. M., Weekly reports of Diseases by, Compiled by Months....324, 326-46

Warsabo, M. D., L. A., Weekly reports of Diseases by, Compiled by Months....325, 353-63

Wasepi, St. Joseph Co., Report on Hog Cholera at....lviii-lx

Washington, Macomb Co., Meteorological conditions at, by Months in 1879 and 1880..120, 404, 405, 414-67

  Reports of Sickness at, in 1880, compiled by months....325, 328-75

Washington, M. D., W. S., Weekly reports of Diseases by, Compiled by Months....324, 332-74

Watkins, Col. E. C., Meteorological instruments intrusted to, Fiscal Year 1881.... xix

Watkins, G. A., Reference to Paper by, on Supply of Milk in Cities.... 177

Waters, Potable, Classified as to Source.... 42

Water, Relative Evaporation of, from Soil of Forests and Open Lands.... 41

Water-sewerage, Dr. Daniel Clark on.... 27-9

Water-supply, Importance of Drainage to.... 45-6

Water-supply, Improvement in Health by Purification of, in Delhi, etc., India.... 13-14

Weather in Mich. in 1880, Report concerning (See Meteorological Conditions).... 403-67

Weather, Value of Knowledge concerning....114, 117, 122, 124

Weaver, Dr. L. S., Report on Diphtheria in Denver township, Newaygo Co.... xlviii

Webberville, Reports of Deaths and Sickness in, in 1880....254, 258, 260, 279-80, 325, 327-75

Wedlock, Importance of Health Interests in.... 35

Weekly Reports of Diseases in Mich. in 1880, Compilation of and Report on.... 380-402

  Av. Order of Prevalence of 26 Diseases, Year and Months....314-19, 326-75, 377-9

  Bronchitis, Pneumonia, Membranous Croup, etc., and Coincident Climatic Conditions.... 380-402

  Concerning Severity of 26 Diseases, as Determined by.... 314-9

  Diagrams, Per cent of Reports of 26 Diseases, and Av. for all....308, 382, 390, 400, 401

  Diseases which Caused the Most Sickness, 1877-80 (See p. 265)....312-13, 376-8

  Name of Observers, and No. of Observers and of Reports, by Year and Months....311, 324-5

  Special Reports by Observers for, and by Others.... 329-75

  Per cent of Observers Reporting Each of 26 Diseases, by Year and Months....312-19, 379

  Per cent of Reports Stating Presence of Each of 26 Diseases, by Year and Months, State, Divisions, and Localities....308, 309, 314-23, 326-75, 377-9, 382, 381, 383-401

  Per cent of Weeks Reported Present, and Av. Order for 26 Diseases, by Year and Months, State, Divisions, and Localities....314-19, 326-75, 379

Weekly Reports of Diseases in Mich., History, Statement of Plan of, Specimen Filling of Blank for.... 305-6

  In 1878 and 1879, Diagrams relating to....113, 119, 121

  Relative to Plan of Compiling, etc....306-7, 309-10, 315, 327, 387

  Uses of, Compiled to Show What, etc....112-14, 117-22, 306-7

Wellings, M. D., J. H., Weekly reports of Diseases by, Compiled by Months....325, 327-74

Wells, M. D., C. P., Replies to Circular 40, Diseases in 1880.... 281

Wells, Depth of Water in, and of Ground above Water in, etc., in 1880....368-9, 414-15

  Temperature of Water in, in Mich., by Months in 1880.... 414-15

  Directions for Observing Temperature of Water in.... 410

Welsh, Sergt. L. A., Meteorological Registers Received from, Compiled by Months....404, 405, 414-67

West Bay City, Reports of Sickness at, Compiled by Months....324, 327-74

Western Division of Mich., Meteorological Conditions and Sickness in, in 1880,....258, 260, 274, 311, 321, 324, 326-74, 378-9, 418-66.

Wheat, Summary of Replies Relative to Condition in which it was Secured in 1880.... 266, 270

Wheaton, James, Report on Diphtheria in Bunkerhill township, Ingham Co.... xlv

Whelan, M. D , Bion, Weekly Reports of Diseases by, Compiled by Months....324, 364-70

Whelan, M. D., A. F., on Program for Paper at Battle Creek Sanitary Convention.... 88

Whitney, M. D., A. A., Weekly Reports of Diseases by, Compiled by Months....324, 327-74

Whittaker, Prof.. Holds Consumption to be acquired oftener than Inherited.... 146-7

Whooping-cough Causes more Deaths in Michigan than does Small-pox.... 110

  Av. Order of Prevalence Where and When Present, Year and Months, 1880....315-19, 329-75, 377-9

  Comparative Amount of Sickness from, in Mich., Caused by....262-3, 312-13, 377-8, 401

  Diagram, Per cent of Weekly Reports of, by Months in 1880.... 401

  Great Mortality of Children from, Preventable.... 7-9

  No. of Correspondents Reporting, in Reply to Circular 40, by Months in 1880.... 262-3

  Per cent of Observers Reporting, by Months and Year, 1880....315-19, 379

  Per cent of Weekly Reports of, State and Divisions, Year and Months, 1880....315-23, 377-9, 401

  Per cent of Weeks Present Where Present, Year and Months in 1880....315-19, 329-75, 379

  Summary of Replies concerning No. of Cases of, in Mich., in 1880.... 264

  Times Reported Usually or More or Less than Usually Severe in 1880.... 315-19

Wild Geese Know How to Avoid Climatic Diseases.... 124

PAGE.
Willard, Hon. George, Vice-president Battle Creek Sanitary Convention.......... 87
Williams, M. D., O. C., Weekly Reports of Diseases by, Compiled by Months..........324, 326-74
Willis, Henry, on Need of an Increased Sense of Responsibility for Sanitary Conditions..... 142
Wilson, M. D., J. P., Replies to Circular 40, Diseases in 1880.......... 287
Wind, Comments on Velocity and Direction of, in 1880 and 1879.......... 454
  Av. Velocity of, at Lansing, Miles per hour, by Months in 1880, Tables and Diagrams.... 455-7
  concerning Diagrams on Direction of.......... 411, 459
  Direction of, at Stations in Mich., Year and Months 1880, Tables and Diagrams..........276, 458-64
  Ratio of Velocity and Force of, Formula and Table.......... 408-9
  Velocity of, at Lansing, and Sickness in Mich., by Months in 1880.......... 380-402
  Directions for Observing and Recording.......... 408-9
Winfield, Meteorological Conditions at, in 1880, compiled by months..........404, 422-42
Winter Cholera in Mich. in 1881, Relations of same to Hog Cholera, etc..........xxxix-xl, lx-lxi
Winter, Relative to the Mildness of, in the United States in 1879-80.......... 416
Women, Statistics concerning Practice of Medicine by, in the United States.......... 228
Woodland, at least 20 Per Cent of a Country should be Woodland.......... 66
Woodmere Cemetery, Av. Temp. and Av. Night Ozone at, Months in 1878 and 1879, Diagrams 115-120
Woodward, M. D., C. M., Replies to Circular 40, Diseases in 1880.......... 284
Work of the State Board of Health, Classification, Statement of, for 1881, etc..........viii-xlv
Working Days of Citizens Measure the Prosperity of a State.......... 136
Worsfold, M. D., W., Reference to Paper by, on Danger near Railroad Switches.......... 176
  Report on Cerebro-spinal Meningitis at Jackson.......... lv-lvi
  Weekly Reports of Diseases by, Compiled by Months..........325, 328-63
Wurtz, M. D., L. H., Weekly reports of Diseases by, Compiled by Months..........325, 361-75
Wyandotte, Report of Deaths and Sickness in, in 1880..........255, 259, 260, 287-8, 328-75

Y.

Yates, M. D., Albert, Meteorological instruments intrusted to, Fiscal Year 1881.......... xviii
  Meteorological Registers from, Compiled by Months..........404, 405, 414-67
  Weekly reports of Diseases by, Compiled by Months..........325, 328-75
Yellow Fever, concerning Origin of.......... 203
Yellow Fever in 1880 and Action of National Board of Health concerning.......... 240
Yellow Fever, Public Safety Should Have Benefit of Doubt in Diagnosis of.......... 240
Yellows in Peaches, concerning Dr. Kedzie's Examination of.......... xxxvi
Yemans, M. D., C. C., Reference to paper by, on Cosmetics.......... 176
Ypsilanti, Reports of Deaths and Sickness in, in 1880..........255, 259, 285-6
Ypsilanti, Reports of Sickness at, in 1880, Compiled by Months..........325, 337-75

Z.

Zilwaukee, Reports of Sickness at, in 1880, Compiled by Months..........324, 327-38
Zinc-oxide in Apple Jelly, Poisoning of a Family by.......... xxxvi
Zinc Solution as a Disinfectant, How to Prepare.......... 207, 297
Zinc-sulphate, Use of, as a Disinfectant in Cases of Contagious Diseases, 207, 208, 214, 215, 216, 220, 297, 298.

ERRATA.

Page xxxvi, first line of eleventh paragraph, insert *an analysis of* before *a sample.*

Page 7, change the "running-head" to INTRODUCTORY ADDRESS.

Page 63, tenth line of third paragraph, read—name *malaria* (English "*bad air*"), and study, etc.

Page 174, second line of sixth paragraph, insert *Medical* before *Sciences.*

Page 319, Erysipelas, line third December column, for *6.3* read *5.9.*

Page 326, line numbered "10," "South-eastern Division," second Erysipelas column, for *7.5* read *7.3.*

Page 353, line numbered "67", Coldwater, for *L. H. W.* read *L. A. W.*

Page 405, Altitude of Reed City, for *101.6* read *1016.*

Page 412, fourth line of third paragraph, read—*exhibits are omitted except four,—Exhibits 28, 31, 33, and A, following;* etc.

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